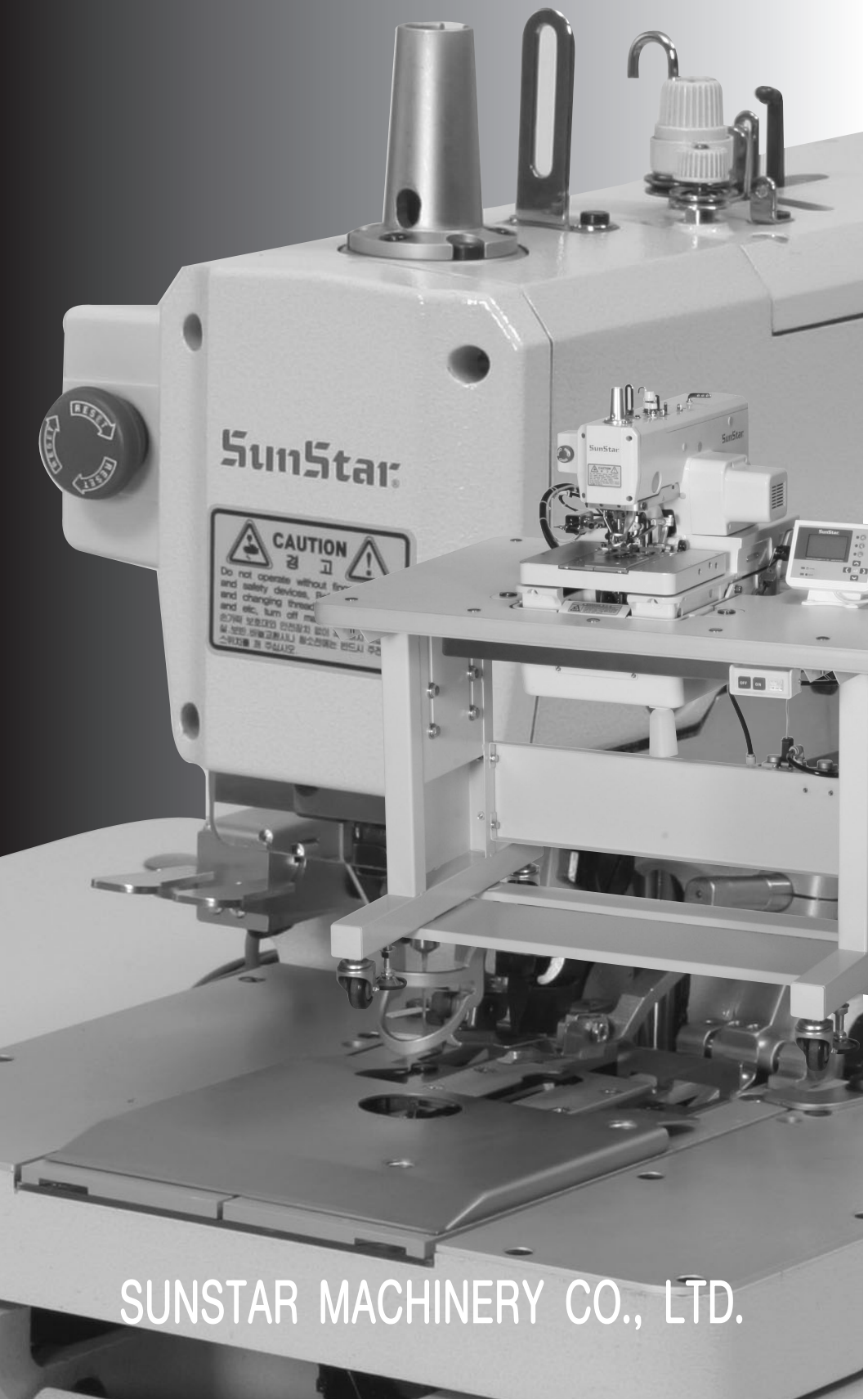
SunStar®

User's Manual

SPS/D-BH-6000 Series

**Direct Drive,
Electronically Controlled
Eyelet Button Hole
Sewing Machine**



1) For proper use of the machine, thoroughly read this manual before use.
2) Keep this manual in a safe place for future reference in case the machine breaks down.

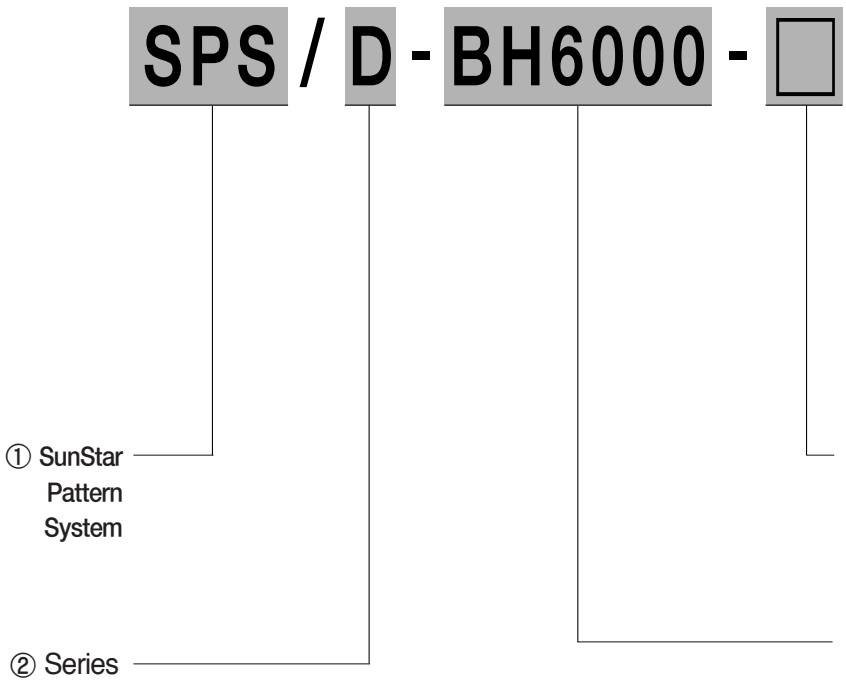
SUNSTAR MACHINERY CO., LTD.

MME-060331

1. Thank you for purchasing our product. Based on the rich expertise and experience accumulated in industrial sewing machine production, SUNSTAR will manufacture industrial sewing machines, which deliver more diverse functions, high performance, powerful operation, enhanced durability, and more sophisticated design to meet a number of user's needs.
2. Please read this user's manual thoroughly before using the machine. Make sure to properly use the machine to enjoy its full performance.
3. The specifications of the machine are subject to change, aimed to enhance product performance, without prior notice.
4. This product is designed, manufactured, and sold as an industrial sewing machine. It should not be used for other than industrial purpose.

SUNSTAR MACHINERY CO., LTD.

Direct Drive, Electronically Controlled Eyelet Button Hole Sewing Machine



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1

Safety Guideline

Safety labels in the manual are categorized into danger, warning and caution. Failure to follow the safety rules may result in physical injuries or mechanical damages.

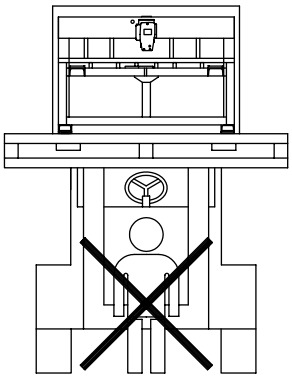
Danger : Instructions here shall be observed strictly. Otherwise, the user could suffer damage from installation, movement, and repair.

Warning : Instructions here shall be observed strictly. Otherwise, the user could suffer severe physical injuries.

Caution : Instructions here shall be observed strictly. So the user could prevent expected malfunction.

1) Machine Transportation

Danger

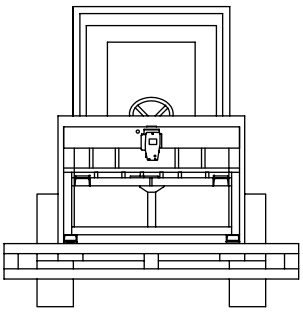


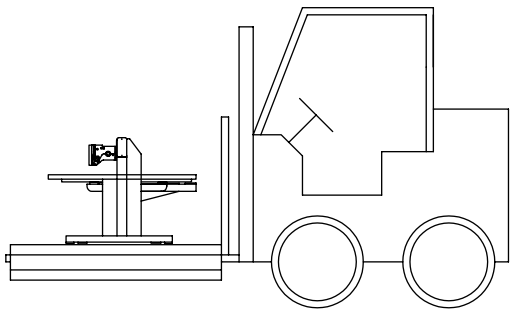
※ Remove obstacles and do not allow people pass under the machine.

Only skilled persons who have the knowledge of safety guide and rules are allowed to transport this machine. The followings shall be kept in mind during transportation.

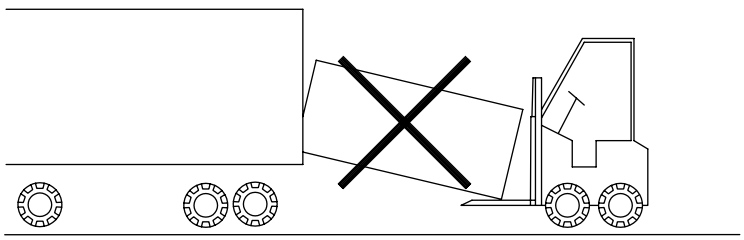
ⓐ More than two people are required to move the machine.

ⓑ To prevent any safety related accidents during transportation, thoroughly wide off the oil spread on the surface of the machine.





[Warning] Especially when using the forklift or crane, unlades the machine horizontally to prevent deformation of the machine and an exposure of a man to danger.



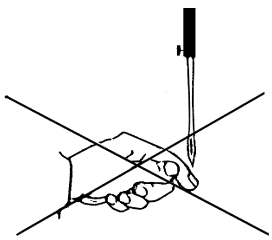
2) Installation

Depending on installation environments, functional errors, breakdown and other physical damages could occur to the machine. The following conditions shall be satisfied for the installation:

ⓐ Please unwrap the machine package starting from the top to the bottom in order. In particular, pay special attention to the nails on the edges in case where the package is a wooden box.
ⓑ Install an air conditioner and clean the machine regularly since dust and moisture can pollute and rust the machine.
ⓒ Install the machine in a place where it is not exposed to direct sunlight. The long-term exposure to direct sunlight could cause discoloration or deformation.
ⓓ Place the machine at least 50cm away from the left, right, front and back walls to secure sufficient space for maintenance.

[Note] Please refer to 4. Installation of the Machine, for more information on machine installation.

3) Operation



The SPS/D-BH6000 Series are made for industrial use to carry out pattern sewing for textiles and other similar materials. Please observe the following guidelines when operating the machine.

ⓐ Please read this manual thoroughly and have a clear understanding before operation.
ⓑ Wear proper clothes for safe machine operation
ⓒ During operation, do not make your hands or parts of your body close to the operating parts of the machine (needle, nook, thread take-up, pulley, etc.).
ⓓ Do not remove any of safety plates and various covers during operation.
ⓔ Grounding system must be connected.
ⓕ Shut off the electric power supply and make sure the power switch is off before opening the power box including control box.
ⓖ Make sure of stopping the machine before inserting a thread through a needle or examining the machine after sewing.
ⓗ Do not turn on the machine with putting a foot on the pedal.
ⓘ Do not plug multiple motors into one electric outlet.
ⓙ Grounding system must be connected.
ⓚ Place the machine away as far as possible from noise generated sources including high-frequency welding machine.

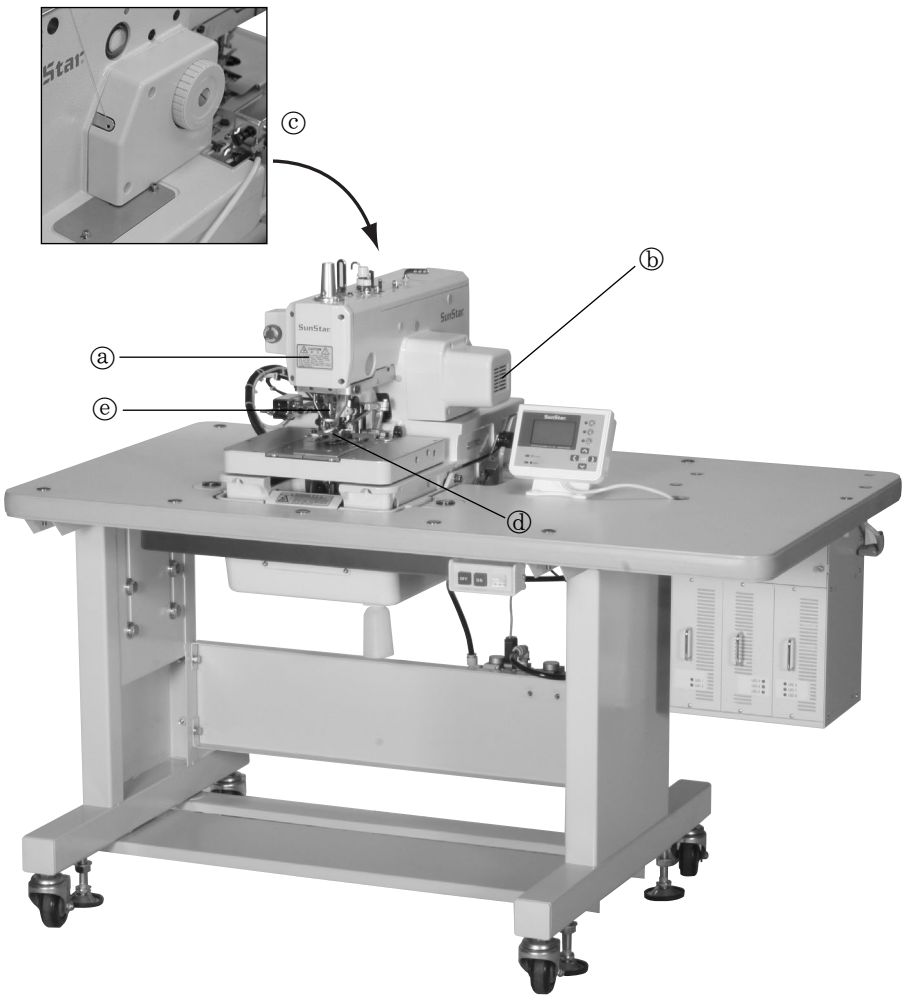
4) Repair

When the machine needs to be repaired, it shall be mended only by designated A/S engineers who have completed training courses of SunStar.

ⓐ Cut off the power supply before cleaning or repairing the machine. After power shut-down, wait for four minutes until electricity is completely discharged from the machine.
ⓑ Without discussion with SunStar, modifying the specifications of the machine or any parts is not allowed. Arbitrary change of the machine could cause dangers during operation.
ⓒ Use the spare parts produced by Sunstar for repairing.
ⓓ Put safety covers which are removed for repair back to the machine after the repairing is done.

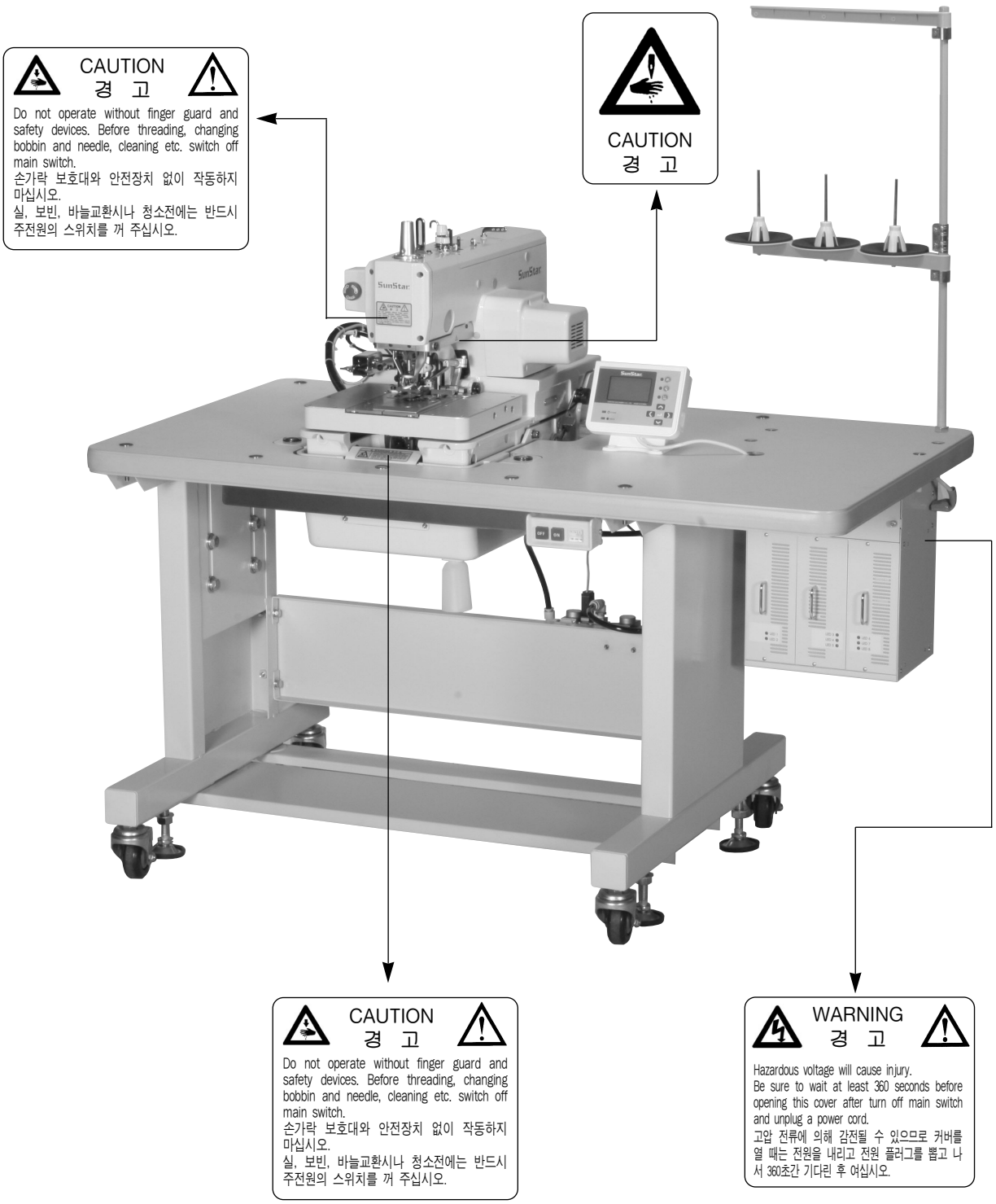
5) Safety Devices

ⓐ Safety label : Cautions during machine operation.
ⓑ Motor cover: Prevents potential accidents which might occur during motor operation.
ⓒ Inside thread supplier cover : Prohibits fingers and the inside thread supplier from contacting each other.
ⓓ Finger guard: Prohibits fingers and needle from contacting each other.
ⓔ Safety plate: Prevents broken needle from injuring eyes.



6) Locations of Warning Mark

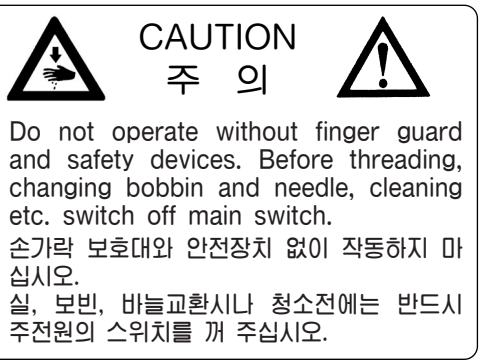
The labels of “Caution” are attached to the machine for safety. When operating the machine, make sure to follow the safety rules that each “Caution” tells.


CAUTION
경 고
Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
손가락 보호대와 안전장치 없이 작동하지 마십시오.
실, 보빈, 바늘교환시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.
CAUTION
경 고
CAUTION
경 고
Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
손가락 보호대와 안전장치 없이 작동하지 마십시오.
실, 보빈, 바늘교환시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.
WARNING
경 고
Hazardous voltage will cause injury.
Be sure to wait at least 360 seconds before opening this cover after turn off main switch and unplug a power cord.
고압 전류에 의해 감전될 수 있으므로 커버를 열 때는 전원을 내리고 전원 플러그를 뽑고 나서 360초간 기다린 후 여십시오.

7) Contents of Warning Mark

Caution

1)


CAUTION
주 의
Do not operate without finger guard and safety devices. Before threading, changing bobbin and needle, cleaning etc. switch off main switch.
손가락 보호대와 안전장치 없이 작동하지 마십시오.
실, 보빈, 바늘교환시나 청소전에는 반드시 주전원의 스위치를 꺼 주십시오.

2)

WARNING
경 고
Hazardous voltage will cause injury.
Be sure to wait at least 360 seconds before opening this cover after turn off main switch and unplug a power cord.
고압 전류에 의해 감전될 수 있으므로 커버를 열 때는 전원을 내리고 전원 플러그를 뽑고 나서 360초간 기다린 후 여십시오.

3)

2

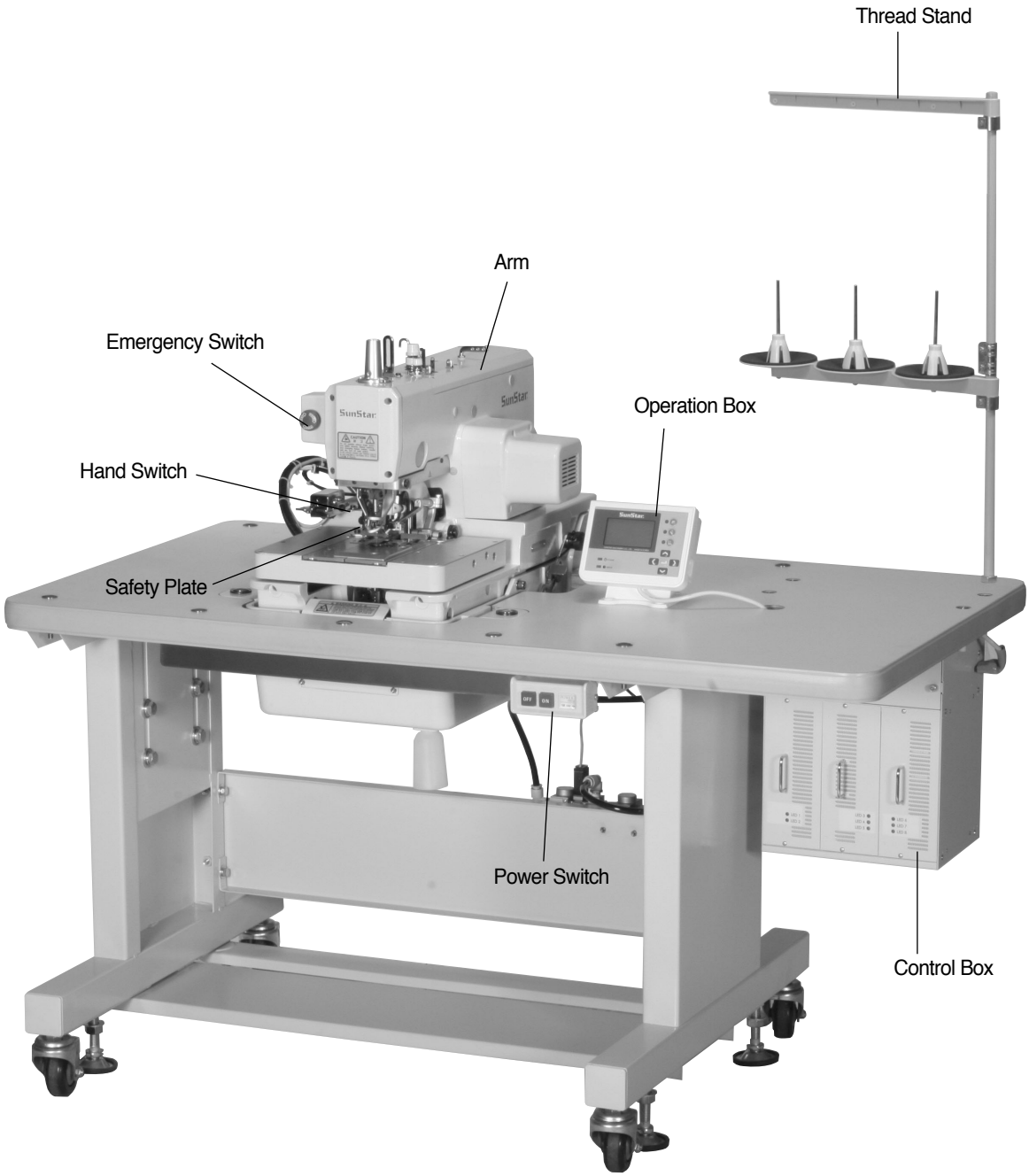
Specifications

<table>
<tr><td colspan="2">Model</td><td colspan="3">SPS/D-BH6000-01</td><td colspan="3">SPS/D-BH6000-02</td></tr>
<tr><td colspan="2">Usage</td><td colspan="3">Male & female suit</td><td colspan="3">Jeans & working clothes</td></tr>
<tr><td colspan="2">Thread Trimming Type</td><td colspan="3">Long Trimming</td><td colspan="3">Short Trimming</td></tr>
<tr><td colspan="2">Sewing Speed</td><td colspan="6">1,000~2,200spm (100rpm step)</td></tr>
<tr><td rowspan="6">Buttonhole Area</td><td rowspan="5">Length</td><td rowspan="5">10~38mm</td><td colspan="5">14~40mm</td></tr>
<tr><td>A</td><td>14~18mm</td><td>E</td><td>28~32mm</td></tr>
<tr><td>B</td><td>18~22mm</td><td>F</td><td>32~36mm</td></tr>
<tr><td>C
(Standard)</td><td>22~26mm</td><td>G</td><td>36~40mm</td></tr>
<tr><td>D</td><td>26~30mm</td><td colspan="2"></td></tr>
<tr><td>Width</td><td colspan="6">1.5~3.2mm</td></tr>
<tr><td colspan="2">Sewing Pitch</td><td colspan="6">0.5~2.0mm</td></tr>
<tr><td colspan="2">Taper Bar Length</td><td colspan="6">0~20mm</td></tr>
<tr><td colspan="2">Needle</td><td colspan="3">Schmetz 558(DO×558)
Nm90(Nm80~Nm120)</td><td colspan="3">Schmetz 558(DO×558)
Nm110(Nm80~Nm120)</td></tr>
<tr><td colspan="2">Press Plate Lift</td><td colspan="3">12mm</td><td colspan="3">16mm</td></tr>
<tr><td colspan="2">Motor</td><td colspan="6">Direct drive type 500W AC servo-motor: 1
Pulse motor: 3</td></tr>
<tr><td colspan="2">Power consumption</td><td colspan="6">600VA</td></tr>
<tr><td colspan="2">Air Pressure</td><td colspan="6">0.5MPa(5Kgf/cm^2)</td></tr>
<tr><td colspan="2">Power Supply</td><td colspan="6">1-phase : 100~240V, 3-phase : 200~440V</td></tr>
<tr><td colspan="2" rowspan="4">Option</td><td colspan="3">Special Lapel Cutter</td><td colspan="3">Fly Indexer</td></tr>
<tr><td colspan="3">Upper Thread Holder</td><td colspan="3">Upper Thread Holder</td></tr>
<tr><td colspan="3">Foot Switch</td><td colspan="3">Foot Switch</td></tr>
<tr><td colspan="3">Mountable on the Table</td><td colspan="3">Mountable on the Table</td></tr>
</table>

3

Components of the Machine

1) Name of components



4

Installation of the Machine

1) Installation environment

A. To prevent any accident caused by malfunction, do not use the machine where the voltage is over the rated voltage ± 10%.

B. To prevent accidents resulting from malfunction, check out the pre-defined pressure of the devices which use air pressure such as air cylinder.

C. For safe operation of the machine, use it under the following conditions.

→ Ambient temperature during operation: 5 ~ 40℃

→ Ambient temperature during storage: - 10 ~ 60℃

D. Humidity: 20~80 % (relative humidity)

2) Electrical environment

A. Power supply voltage

The power supply voltage shall be at the range of the rated voltage ± 10%.

As for power supply frequency, it would be better to use the rated frequency (50/60 Hz) ±1%.

B. Electromagnetic wave noises

Use separate power supply from strong magnetic and high-frequency electric goods. It will be better to put them away from each other.

C. When attaching peripherals and accessories to Control Box, make sure of using low voltage, which is safe.

D. Do not spill water or coffee into Control Box and motor.

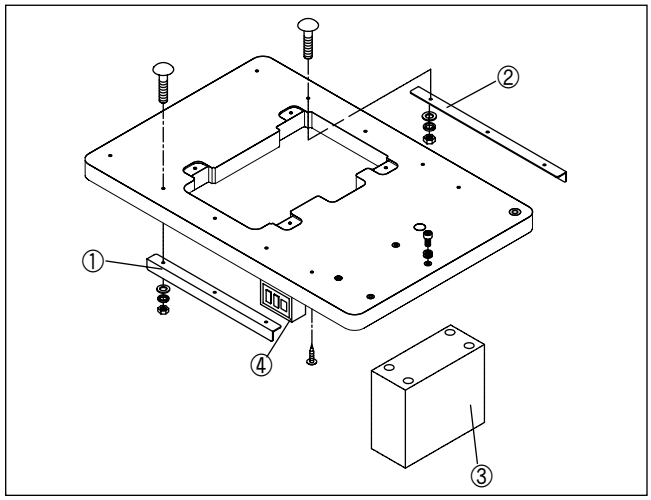
E. Do not drop Control box and motor.

Caution	
• Only trained technicians shall install the sewing machine. • You can inquire our exclusive distributors or electric technicians as for questions regarding electric wiring. • The sewing machine weighs more than 85kg. At least two people are required for installation.	• Until the installation is complete, do not connect the machine's plug to the electric outlet. If the foot pedal is accidentally stepped, it could start the operation, causing injuries. • The grounding system must be connected. If the connection is incomplete, it could cause electrical shock or malfunction. • Put motor covers on the sewing machine head part and the motor.

3) Placing the machine on top of the table

A. Attach the table support plate(front)① and the table support plate(rear)② to the table with bolts, washers and nuts.

B. Attach the control box③ and the power switch④ to the table.



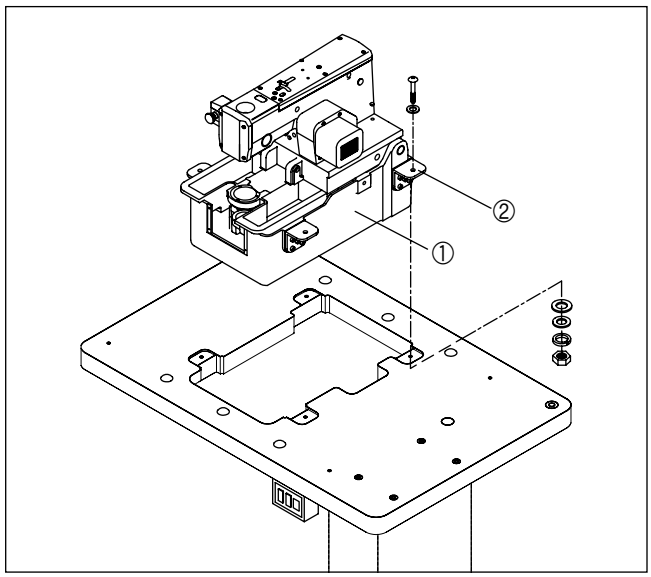
[Fig. 1]

C. Place the machine on top of the table.

[WARNING]

To prevent safety accidents, at least two persons shall handle the machine to place it on top of the table.

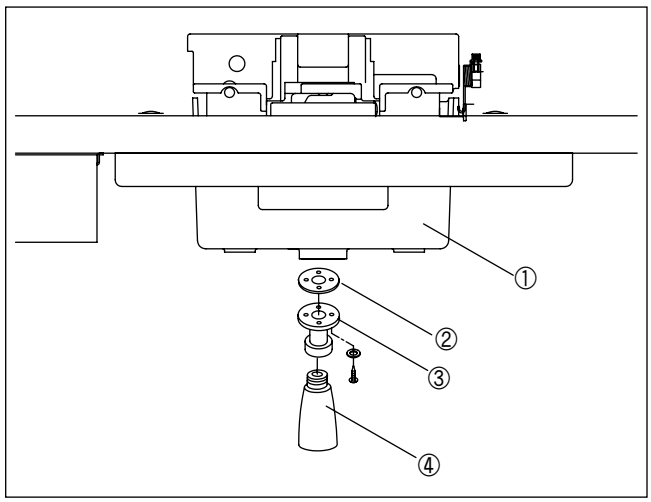
D. Place the four brackets② attached to the bed base① on the marked positions on the table and fix them using bolts, cushion rubbers, washers, spring washers and nuts.



[Fig. 2]

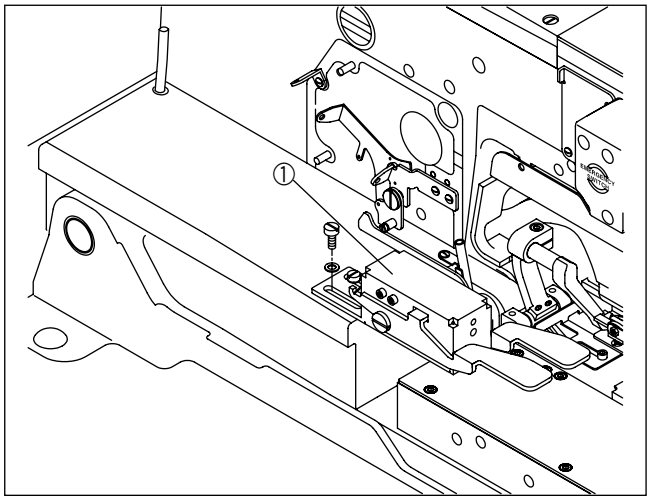
4) Assembling accessories

A. Fix the rubber washer②, the oil container holder③, and the oil container④ below the bed base①.



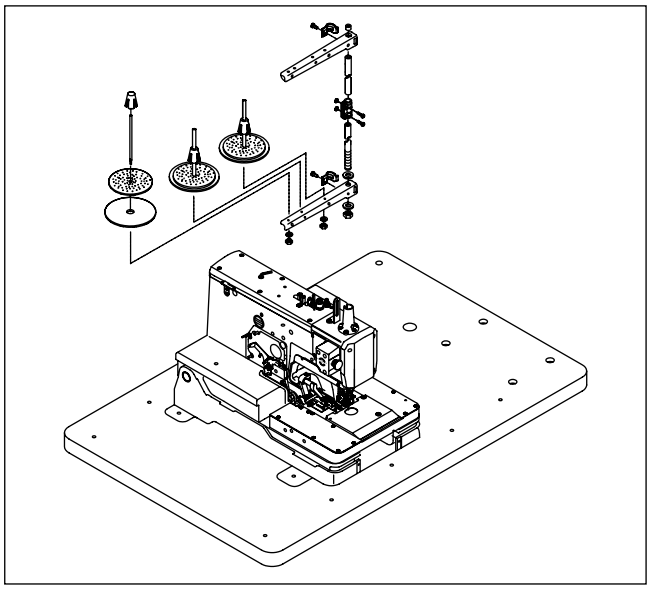
[Fig. 3]

B. Fix the hand switch① to the bed.



[Fig. 4]

C. Install the thread stand on the table.

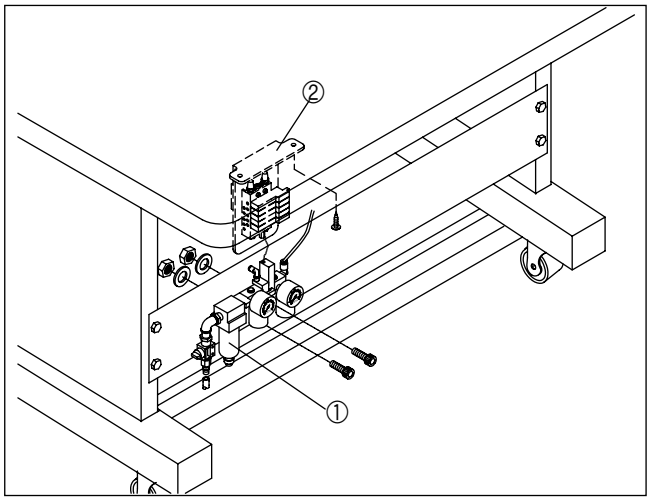


[Fig. 5]

5) Installing pneumatic parts

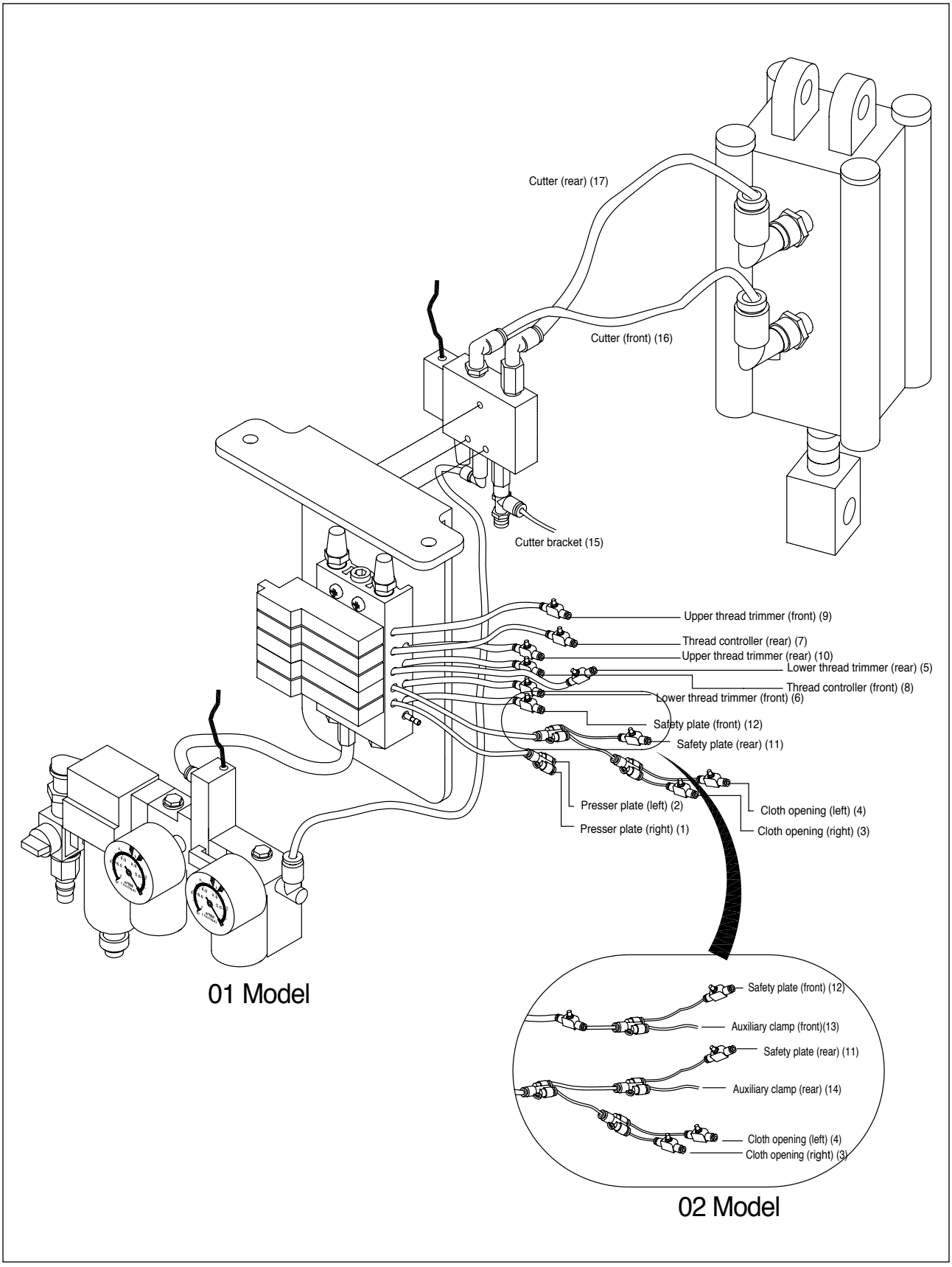
A. Attach the filter regulator① to the rear side of the table legs using bolts and nuts.

B. Attach the solenoid valve② to a proper place on the back of the table using fixing screws.



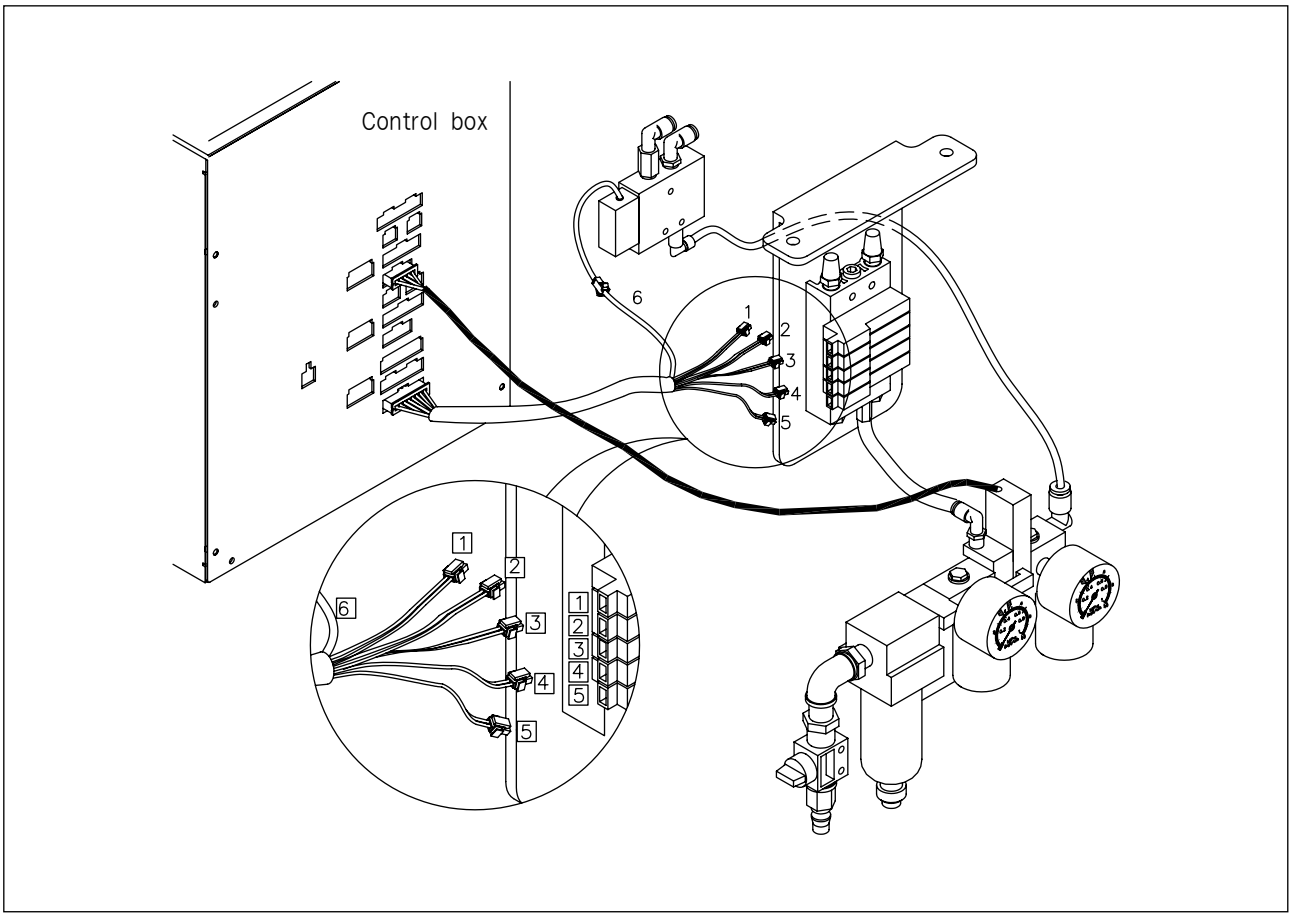
[Fig. 6]

C. Connect air hoses, which are linked to the machine, to solenoid valves.



[Fig. 7]

D. Connect cables, which are linked to the control box, to solenoid valves according to each number .



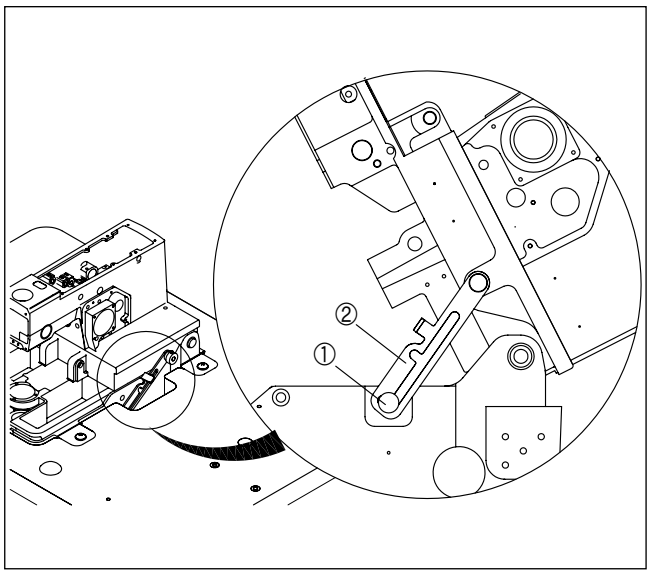
[Fig. 8]

6) Connecting cables to control box

A. Lift the machine as much as possible as in the figure and make the head supporting lever axis (B)① inserted into the groove of the head supporting lever②.

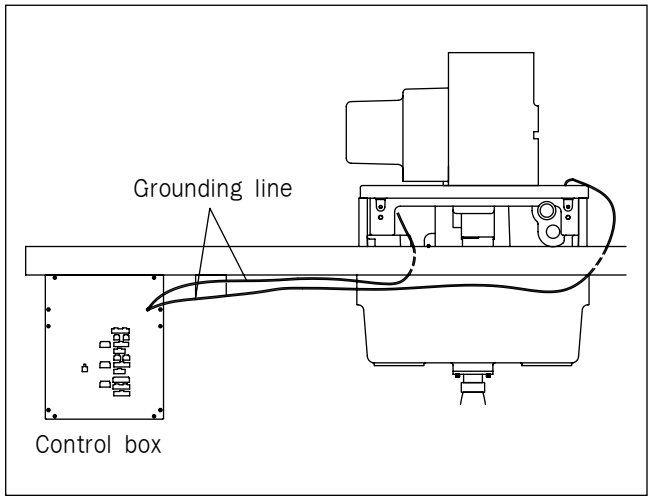
[CAUTION]

When lifting the machine, make sure that the head supporting lever axis(B) is inserted into the head supporting lever groove.



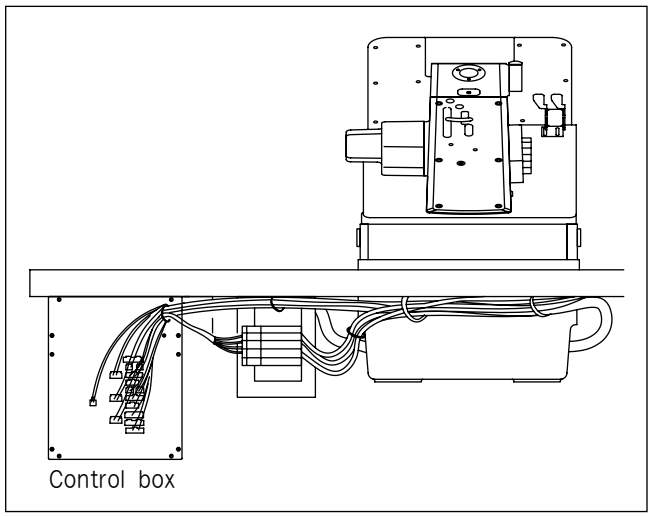
[Fig. 9]

B. Install the grounding line which is linked to the sewing machine and the control box.



[Fig. 10]

C. When the cables are fully connected between the machine and the control box, fix them below the table as in the figure. (estimate the length of cables based on the consideration that the machine should be lifted for fixing the cables)



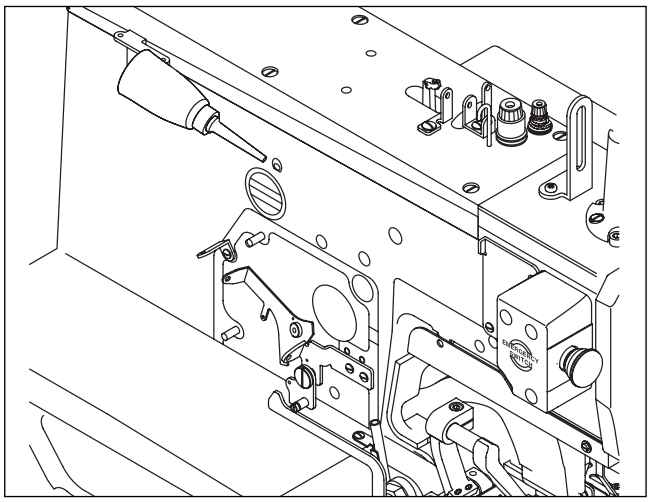
[Fig. 11]

5

Preparations before Operating the Machine

1) Lubrication

A. Check the oil volume in the oil tank installed on Arm. See the arrow marked in the picture and use the oil inlet around the arrow to feed oil into the machine.

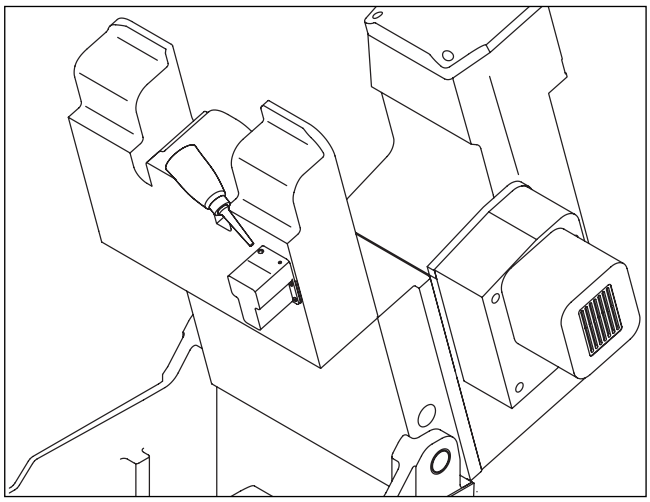


[Fig. 12]

[CAUTION]

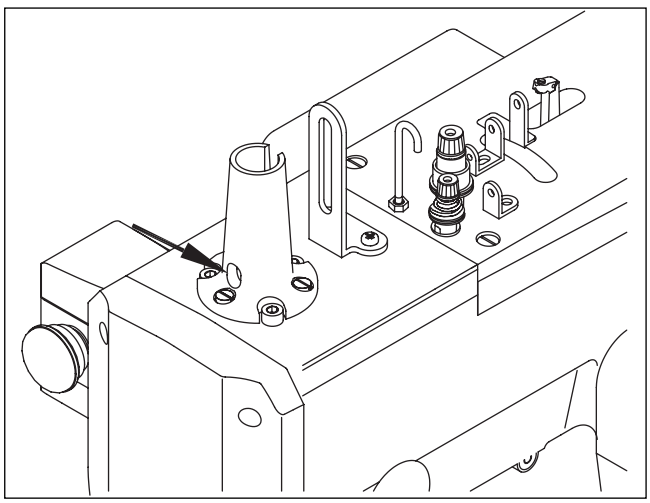
When using the machine first time or when leaving the machine unused for a long term, oil supply is a must.

B. Erect the machine and supply oil to the oil tank installed on bed until the oil reaches the marked line of the tank.



[Fig. 13]

C. Fall 2~3 drops of oil on the needle guard around the upper Arm everyday.



[Fig. 14]

D. Put oil near looper base (everyday)

ⓐ Remove the cloth press plate ①.

ⓑ Lift the body of the machine.

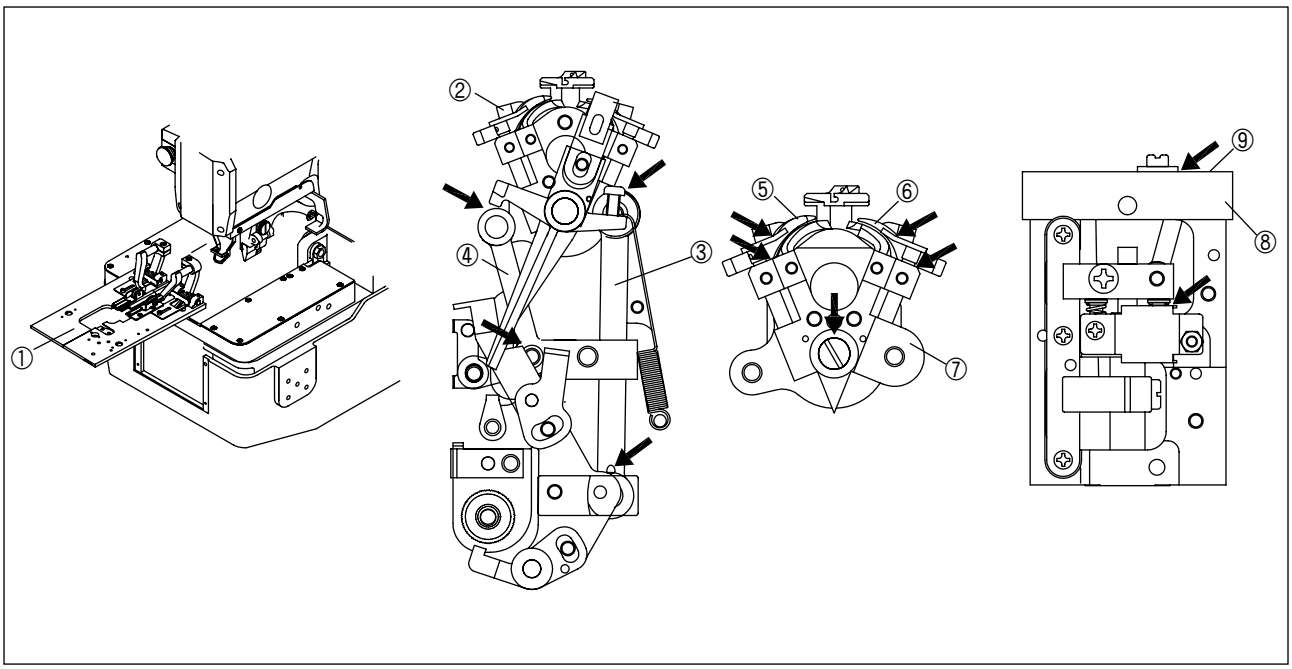
ⓒ Drop oil to the spreader operating cam②, the looper operating link③, and the spreader cam link④

ⓓ Put several drops of oil to the left ⑤ & right spreader ⑥ axles, and the LS Holder Bracket⑦

ⓔ Turn the looper base⑧ and fill oil in the felt marked with the arrow.

ⓕ Drop oil to the looper⑧ and the spinning side of the bushing⑨.

ⓖ Bring down the body of the machine and put the cloth press plate① back to its place.



[Fig. 15]

2) Attach needles

A. Lift the finger guard ①.

B. Turn the hand pulley and move it to the highest position of the needle bar.

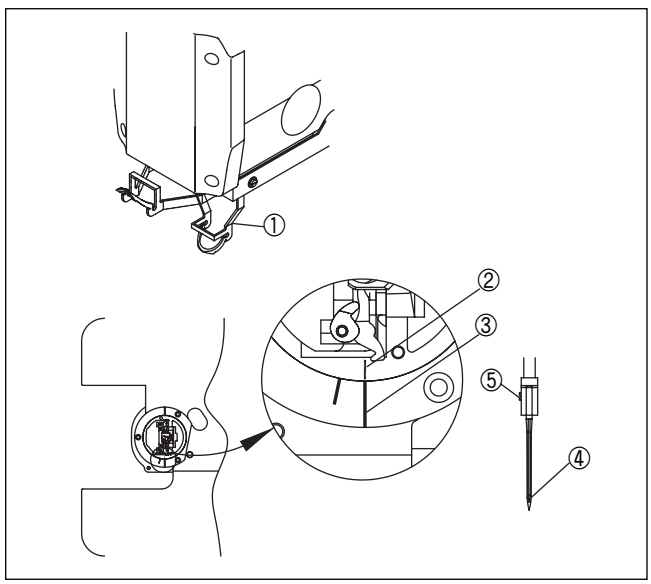
C. Remove the cloth press plate and check whether the punched mark of the looper base ② and that of the looper base bushing ③ meet together.

D. Release the fixing screw⑤ of the needle bar④. Put the long groove of the needle headed upward and push it until the end of the upper side of the needle reaches the end of the needle insertion point of the needle bar. Use the screw to fix the needle⑤.

E. Bring down the finger guard①.

[CAUTION]

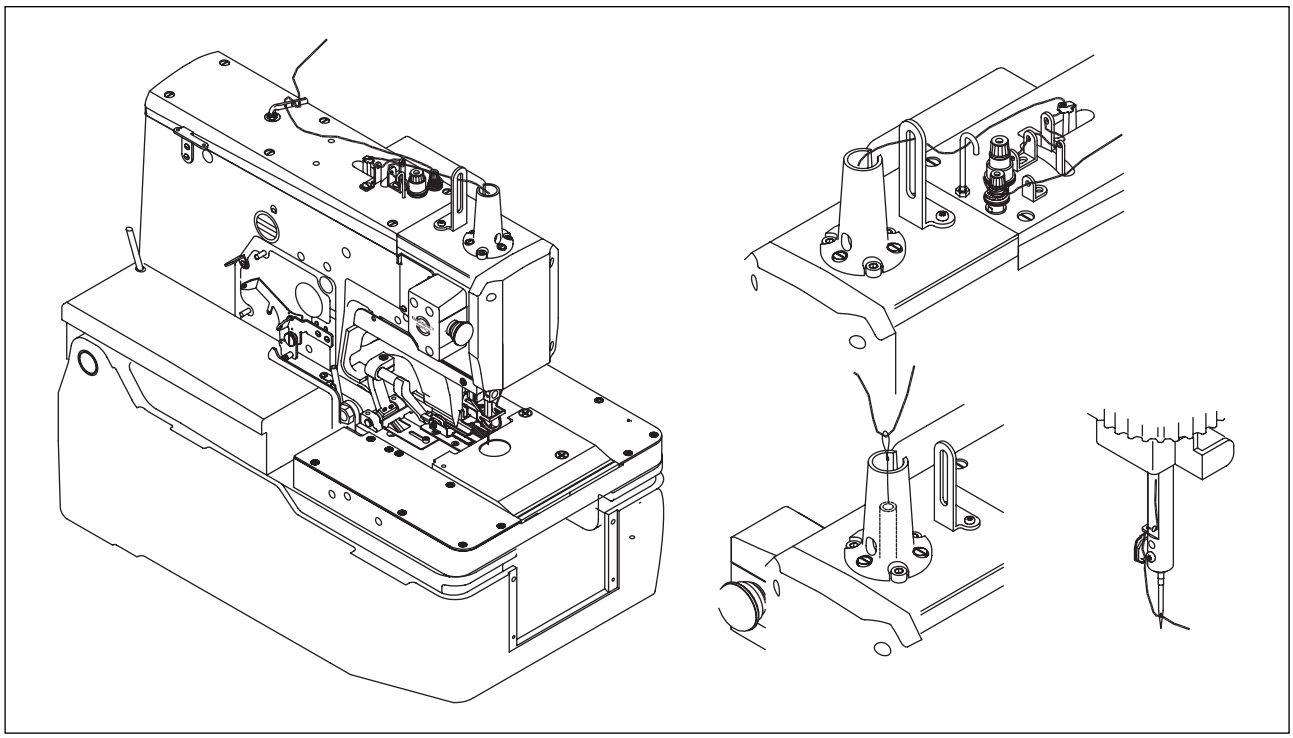
Needle used: Schmetz 558($D_0 \times 558$) Nm80 ~ Nm 120



[Fig. 16]

3) Place upper thread

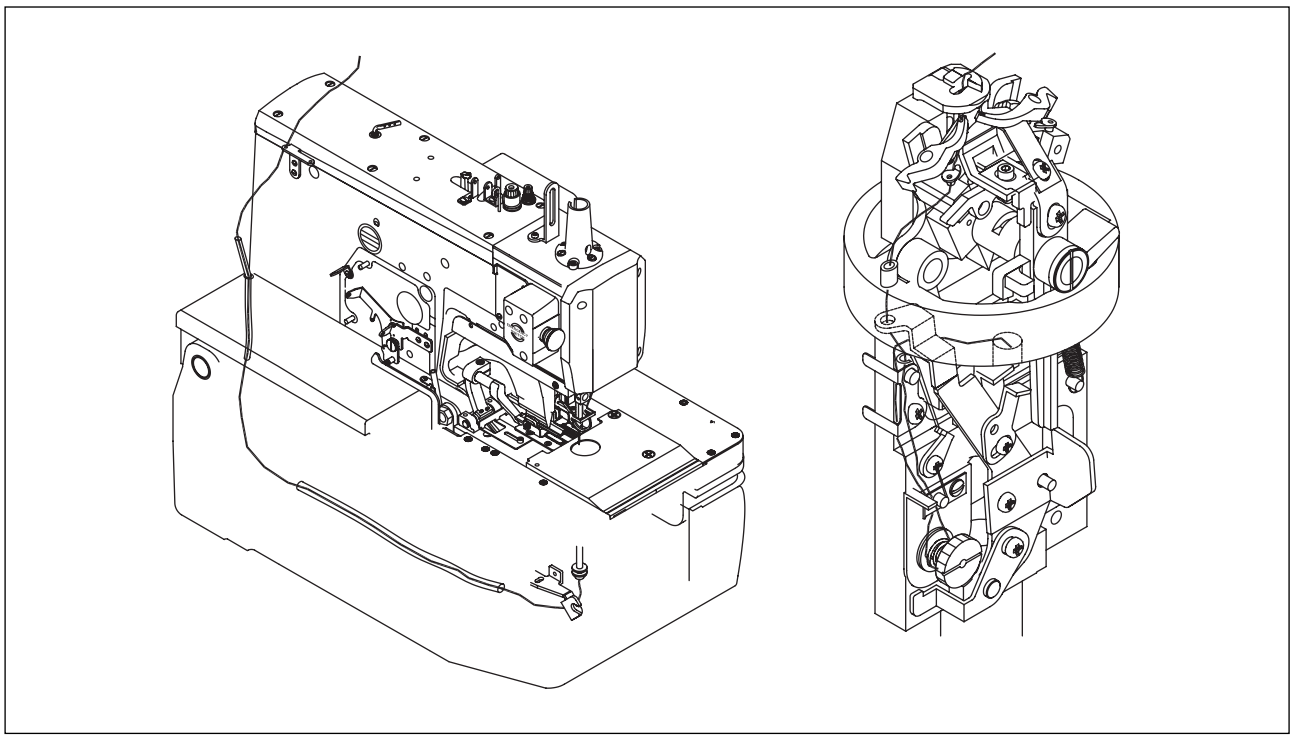
As shown in the figure below, hang the upper thread.



[Fig. 17]

4) Place lower thread

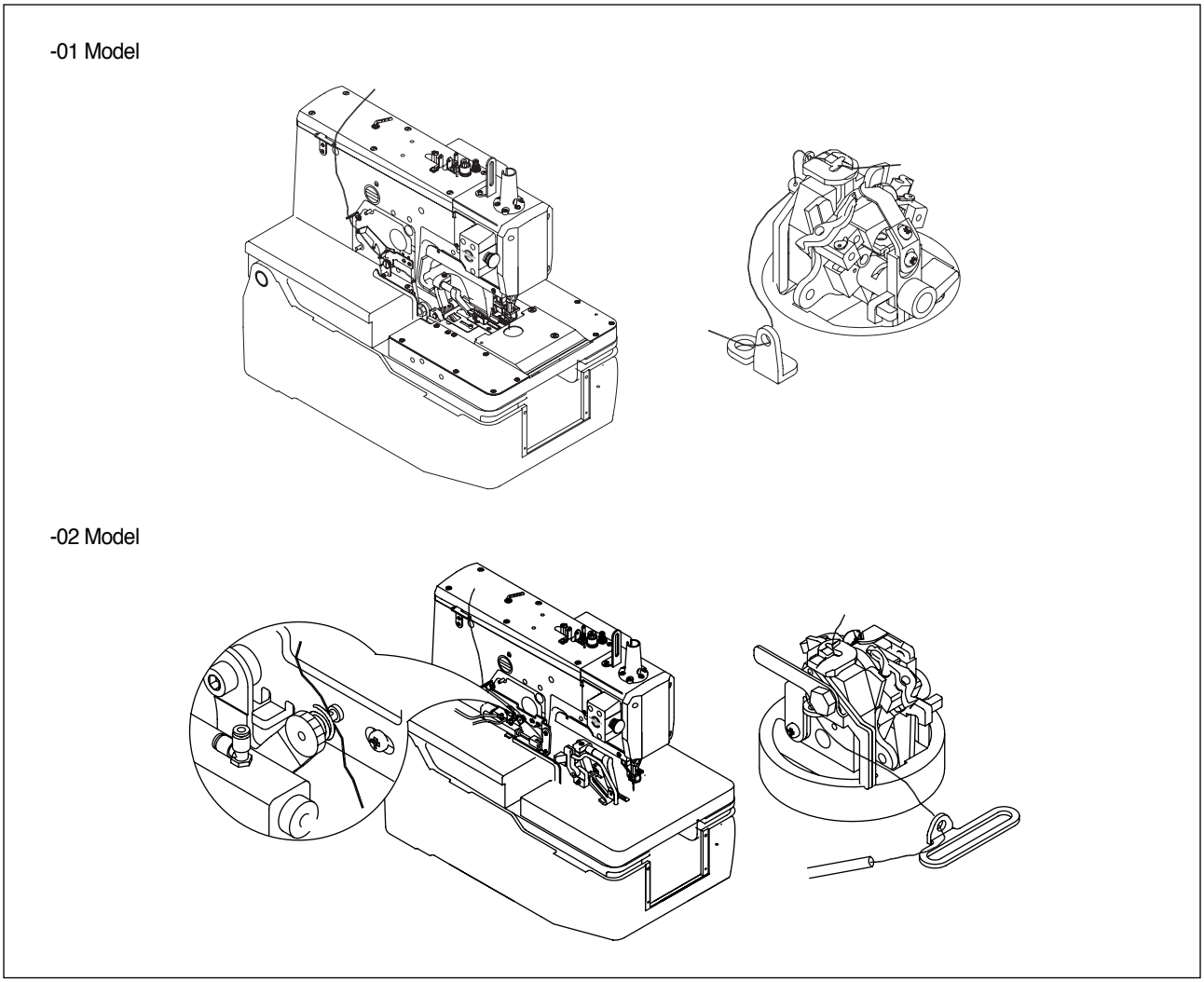
As shown in the figure below, hang the lower thread.



[Fig. 18]

5) Place inside thread

As shown in the figure below, hang the inside thread.



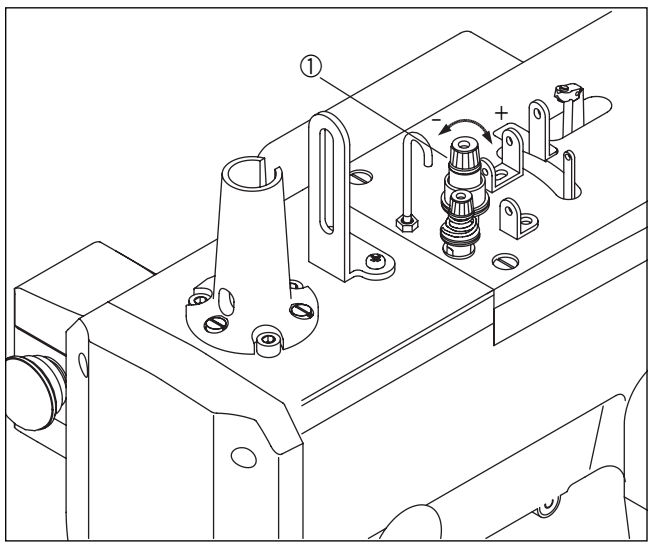
[Fig. 19]

6) Adjust thread tension

A. Upper thread tension

As displayed in the figure, turn the tension adjusting nut ① of the thread adjusting device clockwise, and the upper thread tension gets stronger. If it is turned counter-clockwise, the tension gets weaker.

The tension should be adjusted depending on the threads used and the sewing materials.



[Fig. 20]

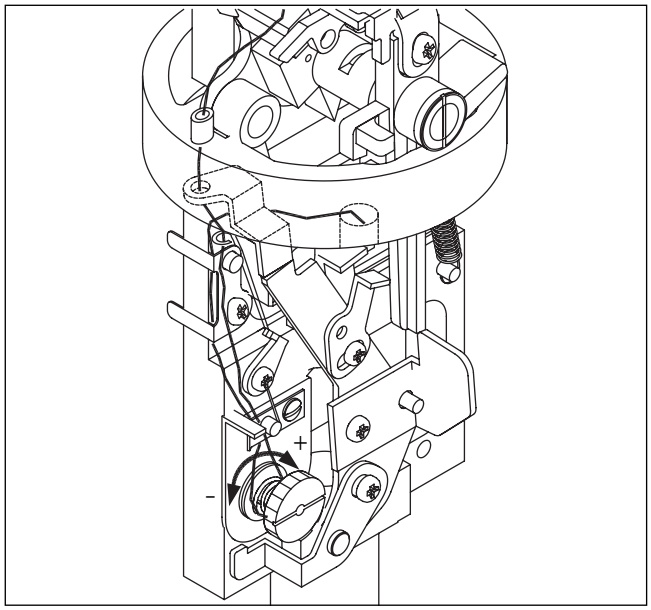
B. Lower thread tension

As displayed in the figure, turn the tension adjusting nut ① of the thread adjusting device clockwise, and the lower thread tension gets stronger. If it is turned counter-clockwise, the tension gets weaker.

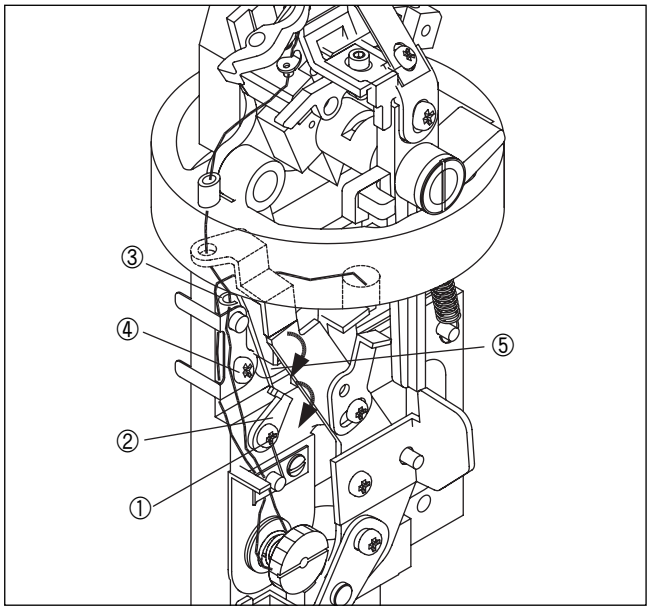
C. Adjust thread take-up spring tension and movement

ⓐ Release screw① and turn the lower thread supporting spring plate② in the direction of the arrow, and the tension of take-up spring③ will increase.

ⓑ Release screw④ and turn the lower thread supporting spring guide⑤ in the direction of the arrow, and it will increase the movement of the take-up spring③.



[Fig. 21]



[Fig. 22]

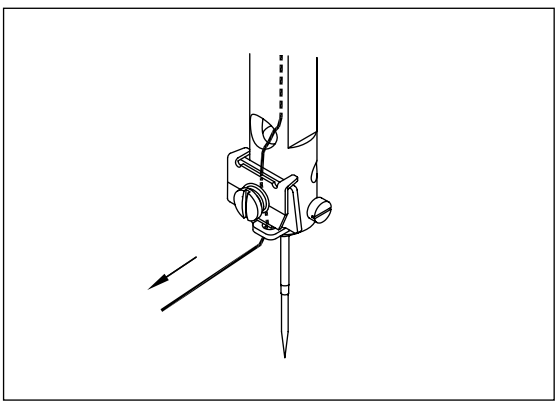
Ref) Thread Tension Values

Tension adjustment is required depending on sewing conditions (sewing materials and thread).

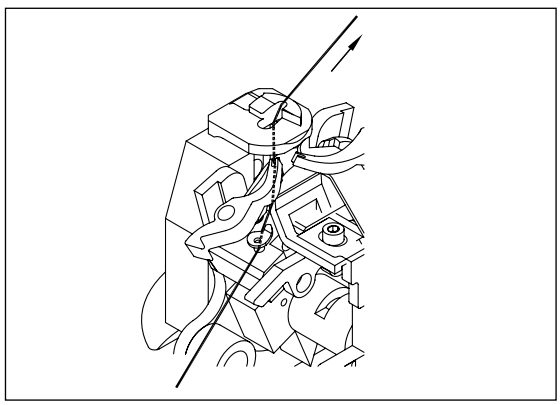
Classification	General Materials (Wool)	Heavy Materials (Denim)
Upper Thread Tension	90g(#30, Polyester)	100g(#30, Cotton)
Lower Thread Tension	30g(#30, Polyester)	80g(#30, Cotton)
Spring Tension of Thread Take-up Lever	5g	7g
Spring Stroke of Thread Take-up Lever	8mm	8mm

1. The tensions of the upper thread in the above table are measured when the upper thread is taken out through the thread hole on the lower part of the needle bar (figure a).

2. The tensions of the lower thread in the above table are measured when the lower thread is taken out through the thread hole on the needle plate (figure b).



[Fig. a]



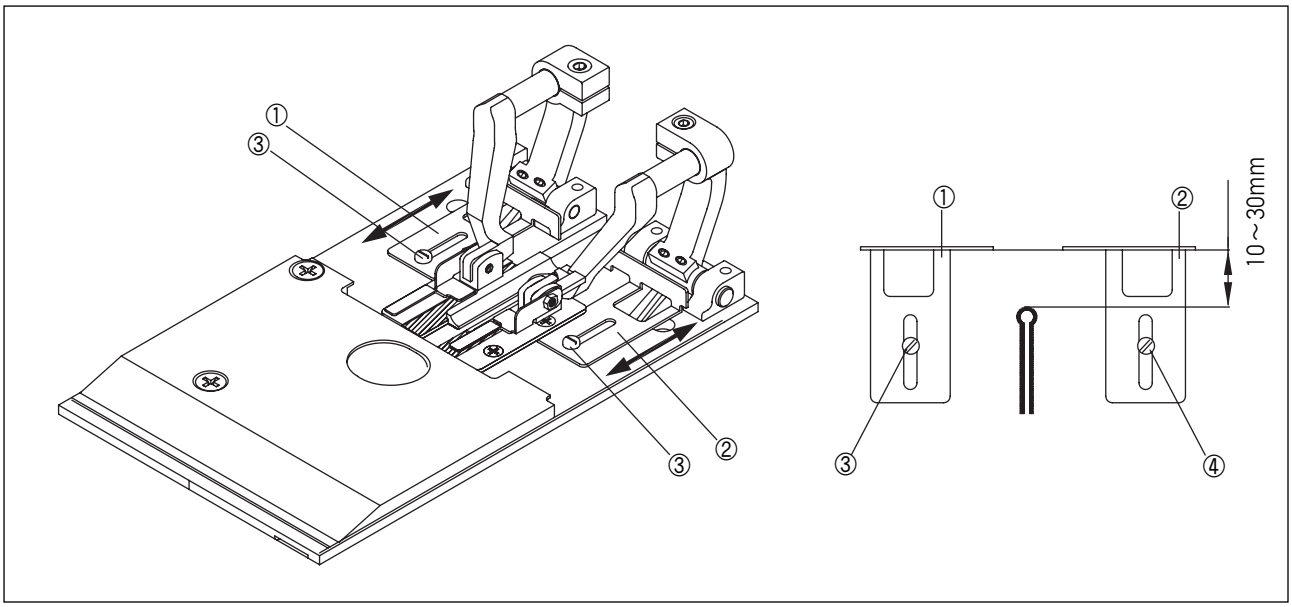
[Fig. b]

7) Adjust sewing margin

A. Insert the sewing cloth into the left ① and right ② cloth guides, until it is touched with them.

B. 10~30mm are proper for sewing margin.

C. Release the screw③ and move the left ① and right ② cloth guides to adjust sewing margin.



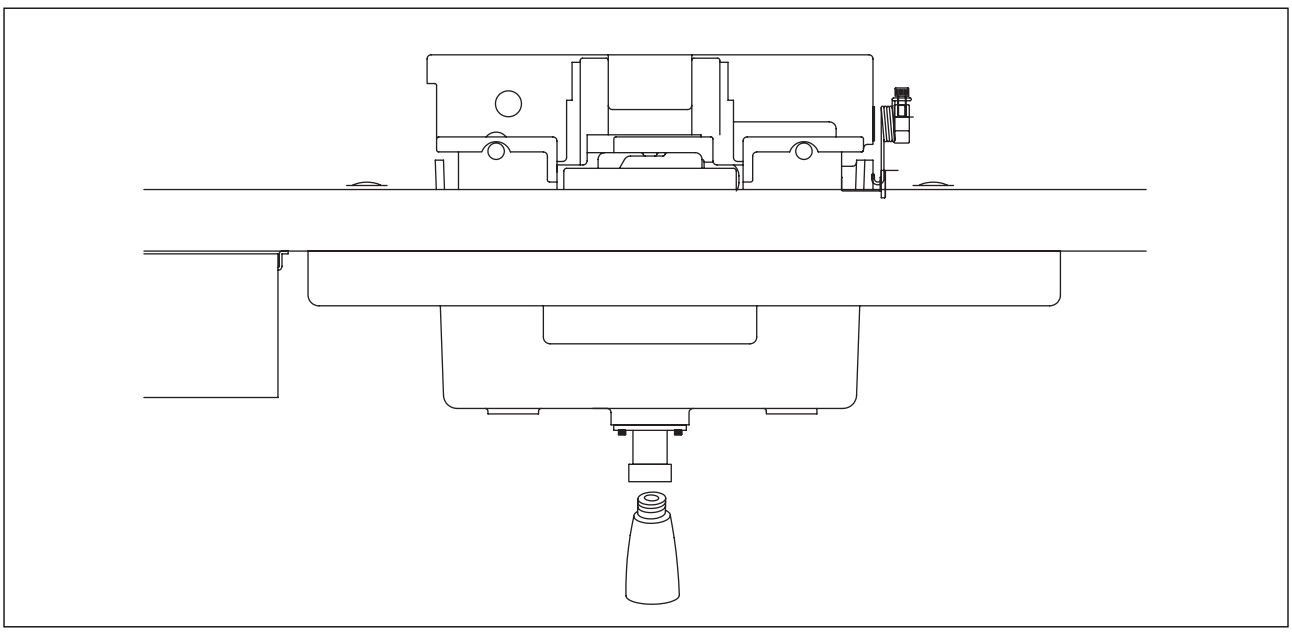
[Fig. 23]

8) Handle used oil

When the oil container at the bottom of the bed base is filled with used oil, empty the oil container.

[CAUTION]

While removing the oil container, oil contents could spill to the floor. It would be better to place cloth, paper or oil container on the floor.



[Fig. 24]

6

Maintenance and Repair

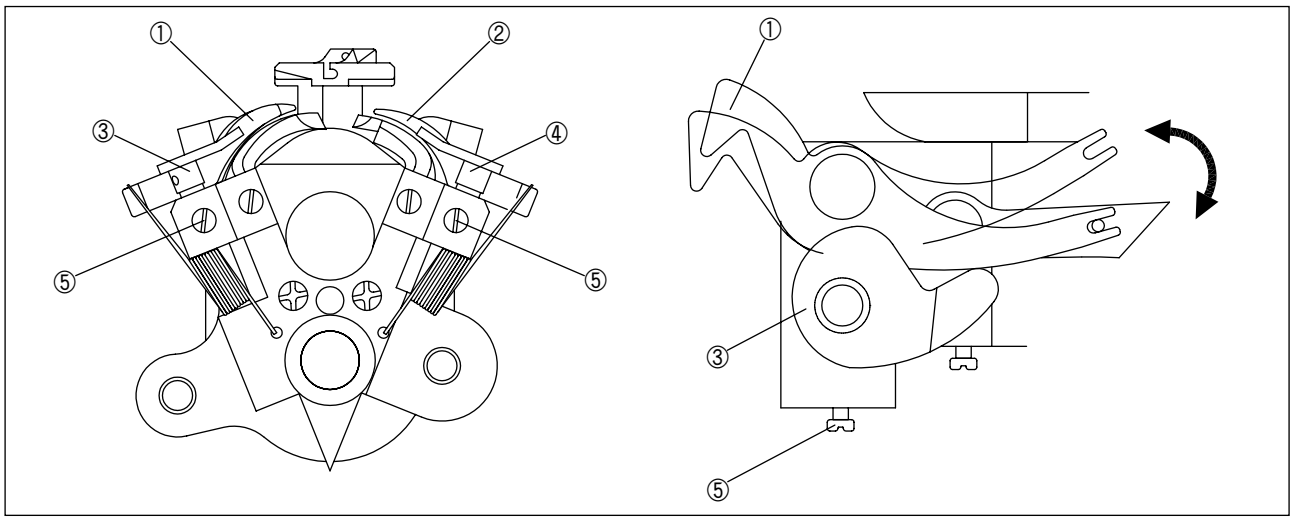
WARNING	The machine is configured to be in its best condition when shipped out from the factory. Arbitrary adjustment is not recommended. When parts replacement is necessary, use the parts approved by SunStar only.

1) Adjust the height of spreader and looper

A. Height of spreader

ⓐ Adjust the left① and right② spreaders to make them move smoothly.

ⓑ Loosen the screw⑤ and make adjustment by changing the height of the left③ and right spreader stopper④. At the proper height, tighten the screw⑤.



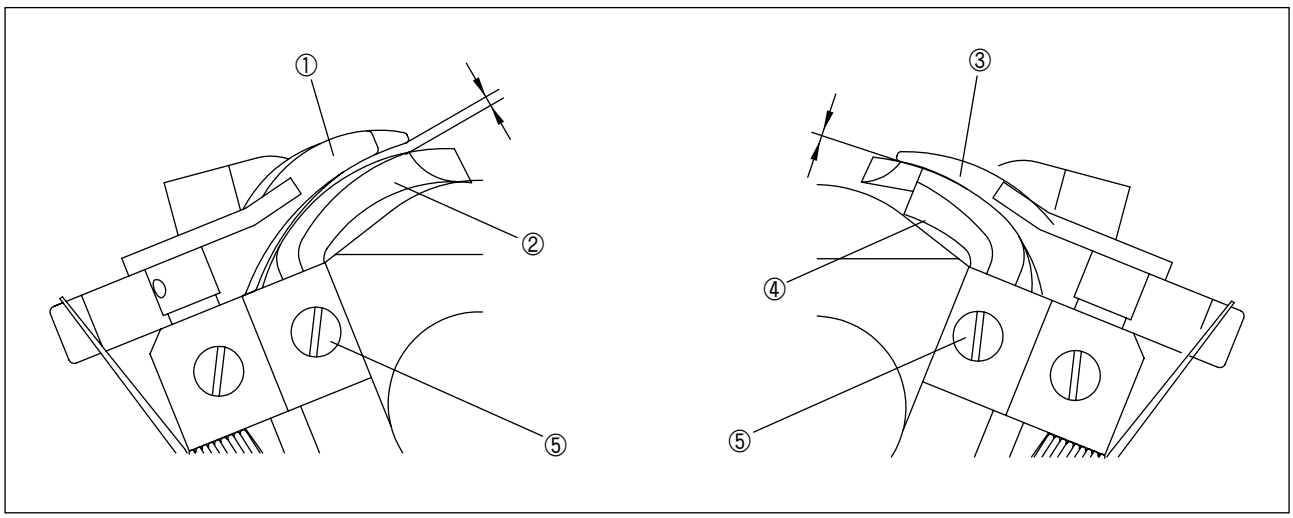
[Fig. 25]

B. Height of looper

ⓐ Set the gap between spreader (left)① and looper (left)② at the thickness of the lower thread.

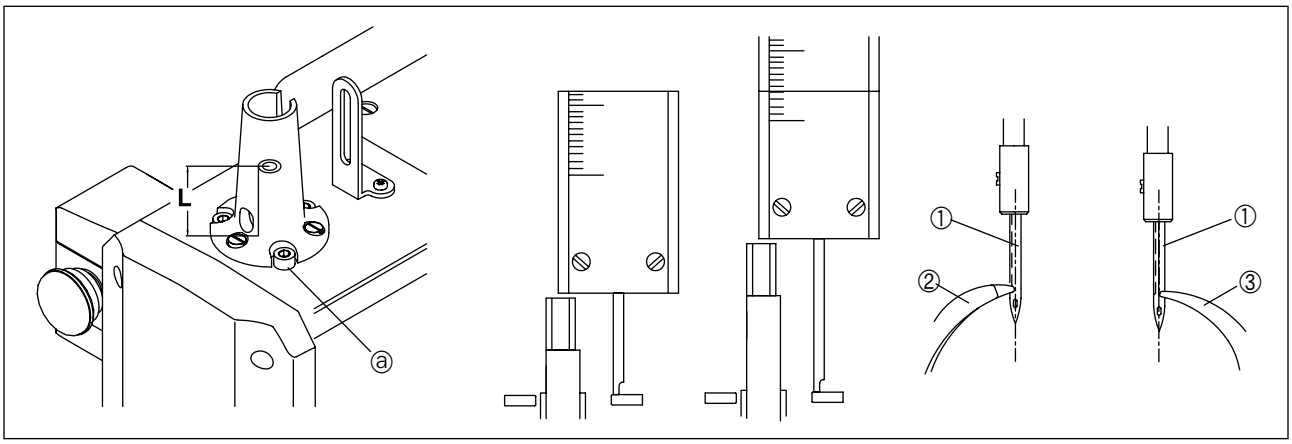
ⓑ Set the gap between spreader (right)③ and looper (right)④ at the minimum distance.

ⓒ Loosen the screw⑤ and move the left ② and right④ looper up and down for adjustment.



[Fig. 26]

2) Adjust the timing of needle and looper



[Fig. 27]

A. Move the needle bar to the lowest position.

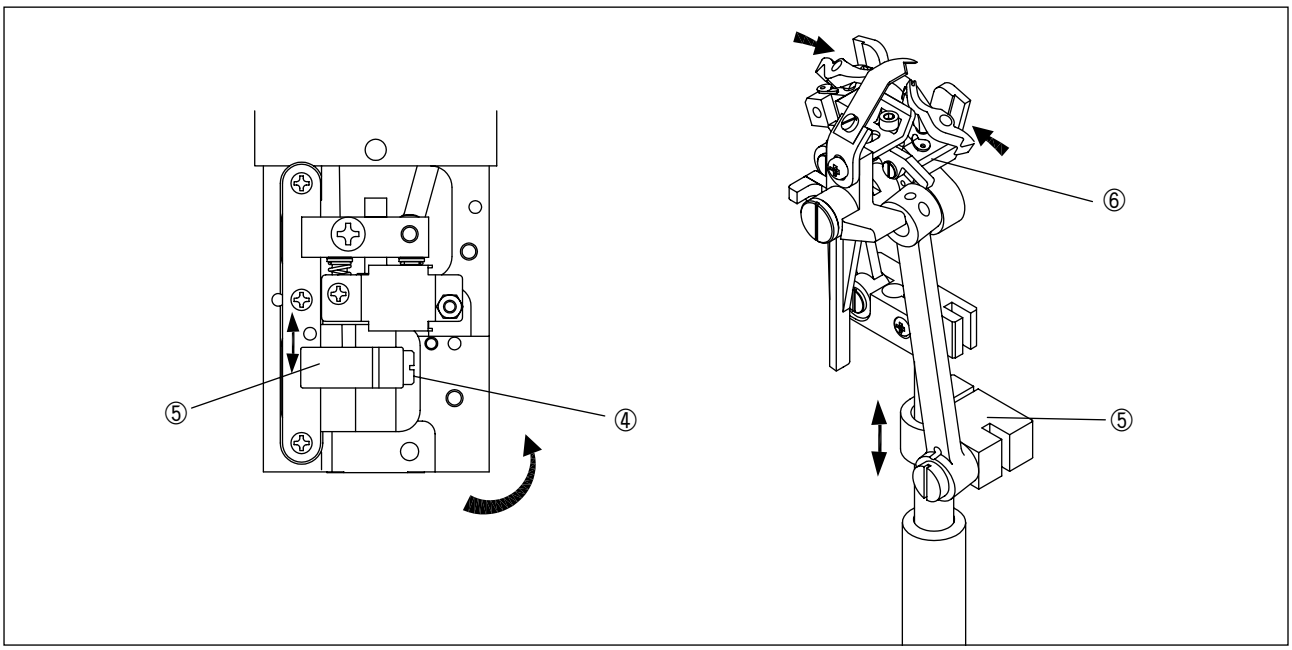
B. When the needle is at the lowest position, use calipers to measure the distance(L) from the tip of the needle bar to the upper side of the needle bracket.

C. When the needle① is at the left side, spin the upper axis until the end of looper(left)② is pointed at the center of the needle. Use calipers to measure the distance from the tip of the needle bar to the upper side of the needle bracket as in B. Calculate the difference between the measured values of B and C.

D. When the needle① is at the right side, calculate the difference between the two measurements as in C.

[CAUTION]

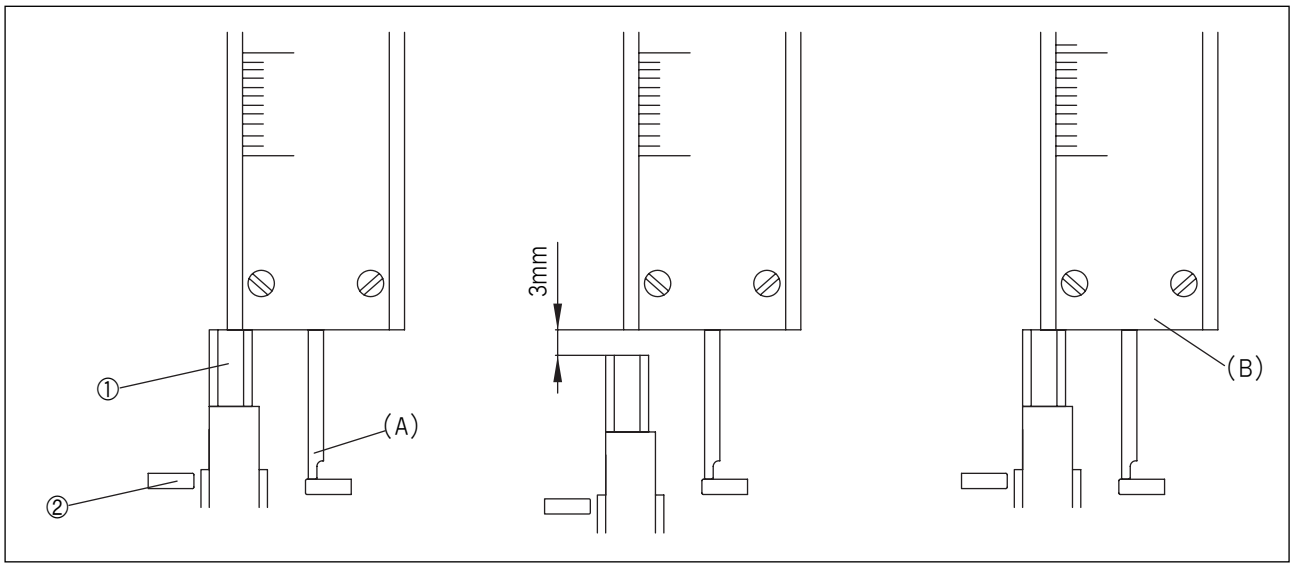
- If the needle① is at the left side, the end of the looper (left)② shall be set at the center of the needle①. If the needle ① is at the right side, the end of the looper (right)③ shall be set at the center of the needle①.
- The distance from the end of the needle bar to the upper side of the needle bar bracket shall be same when the needle① is at the left side and when it is at the right side(as well).
- Do not unloosen the needle bar bracket screwⓐ(yellow paint mark) of one's own accord after completion origin point setting. In such a case, reset needle bar origin point.



[Fig. 28]

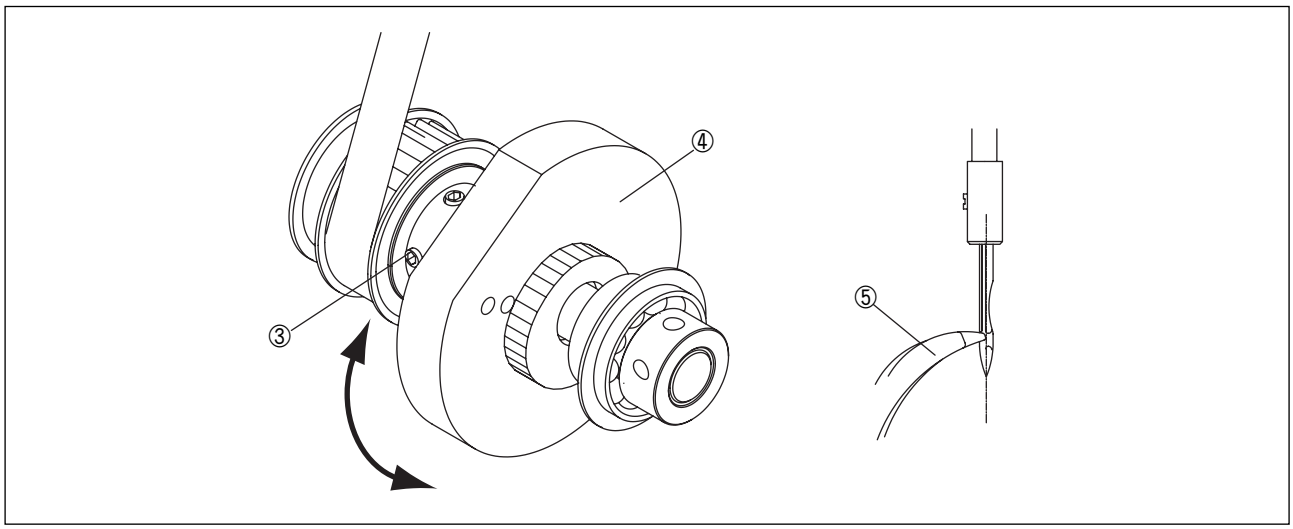
E. When adjustment is needed, turn the looper base in the direction of the arrow as in the picture. Then loosen the screw④ and move the looper link clamp⑤ up and down to move the LS holder bracket⑥ left and right (in the direction of the arrow).

3) Adjust looper stroke



[Fig. 29]

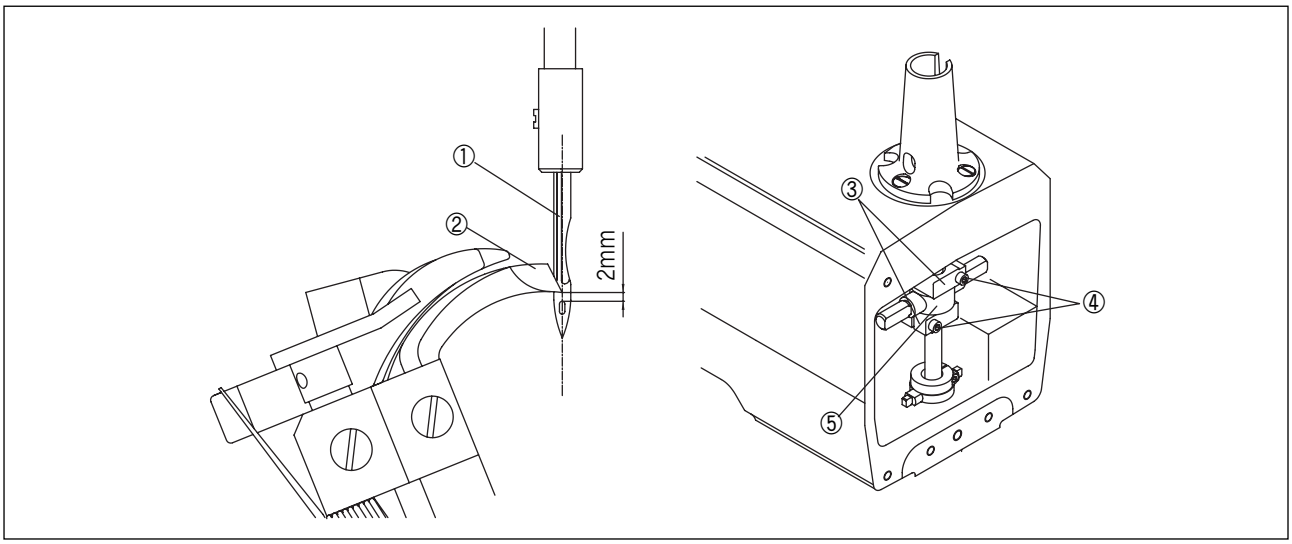
A. Locate the needle bar at the lowest point when the needle is at the left side. Use calipers to measure the distance from the end of the needle bar① to the upper side② of the needle bar bracket.
B. Add 3mm to the value measured in A.
C. Make the end of calipers (A) contact the upper side② of the needle bar bracket. Turn the upper pulley to make the end of the needle bar① contact the edge of calipers(B). Check whether the end of the left looper is touching the center of the needle.
D. Repeat the above procedures to check whether the end of the right looper is touching the center of the needle in case where the needle is at the right side.



[Fig. 30]

E. If the end of the looper doesn't meet the center of the needle, lift the body of the machine.
F. Loosen the two screws③ of the lower axle timing belt, hold the hand pulley to fix it and then turn the lower cam in the direction of the arrow to make the end of the looper (left)⑤ contact the center of the needle. When they are matched, tighten the two screws③.
G. Check if the right degree of pressure is put on the screws.

4) Adjust the height of needle bar



[Fig. 31]

A. When the needle① is within the sewing zone, adjust the center of the needle and the end of the looper (left)② to meet together.

B. Release the screw④ of the needle bar clamp③ and adjust the height of the needle bar.

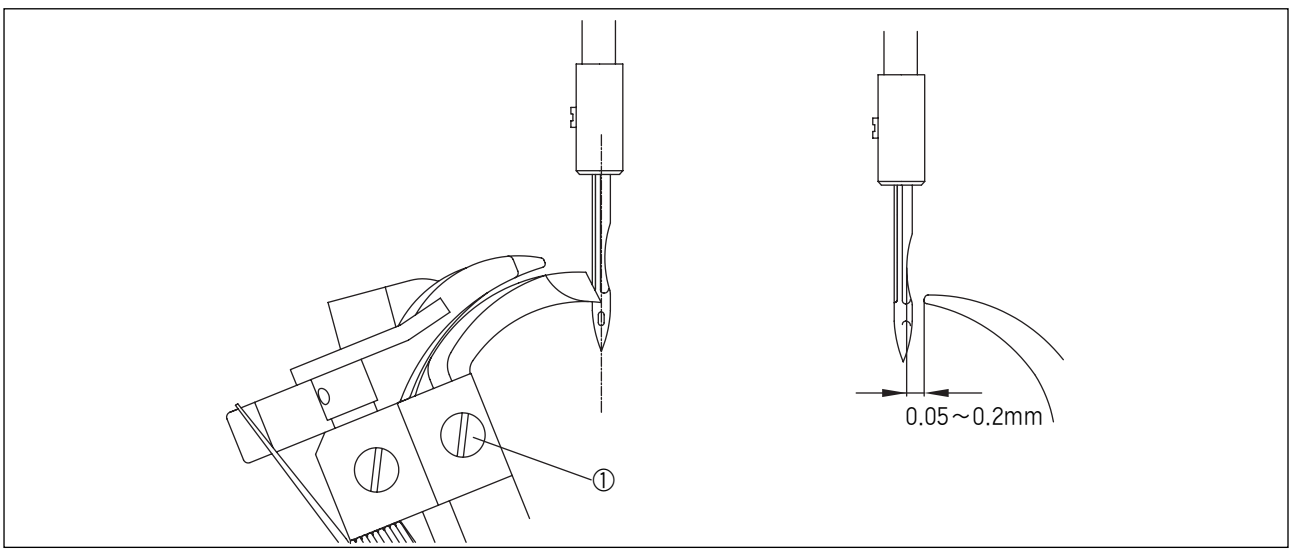
> Make the end of the looper (left)② meet the upper edge of the needle hole and lower the needle bar by 2mm.

C. Make adjustment to enable the needle bar clamp③ and the needle bar horizontal link⑤ to maintain their own oil layers respectively.

5) Adjust the distance between needle and looper

Loosen the looper screw① to adjust the distance between needle and looper at the range of 0.05~0.2mm, and then tighten the screw① again.

> **[CAUTION]**
> Although the looper base turns 360° , the distance between needle and looper should be same.

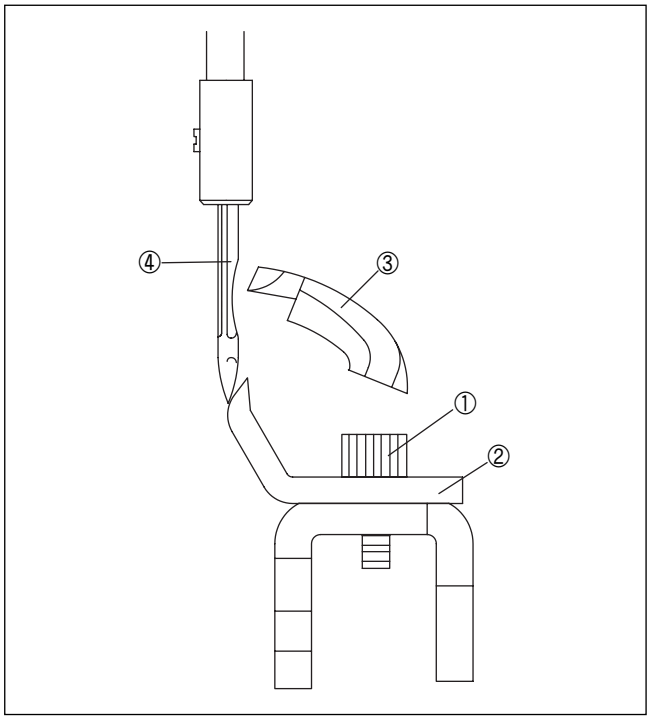


[Fig. 32]

6) Adjust needle guard

A. Loosen screw① and adjust the position of the needle guard②.

B. Until the end of the looper③ touches the needle④, the needle④ shall not move against the needle guard②.

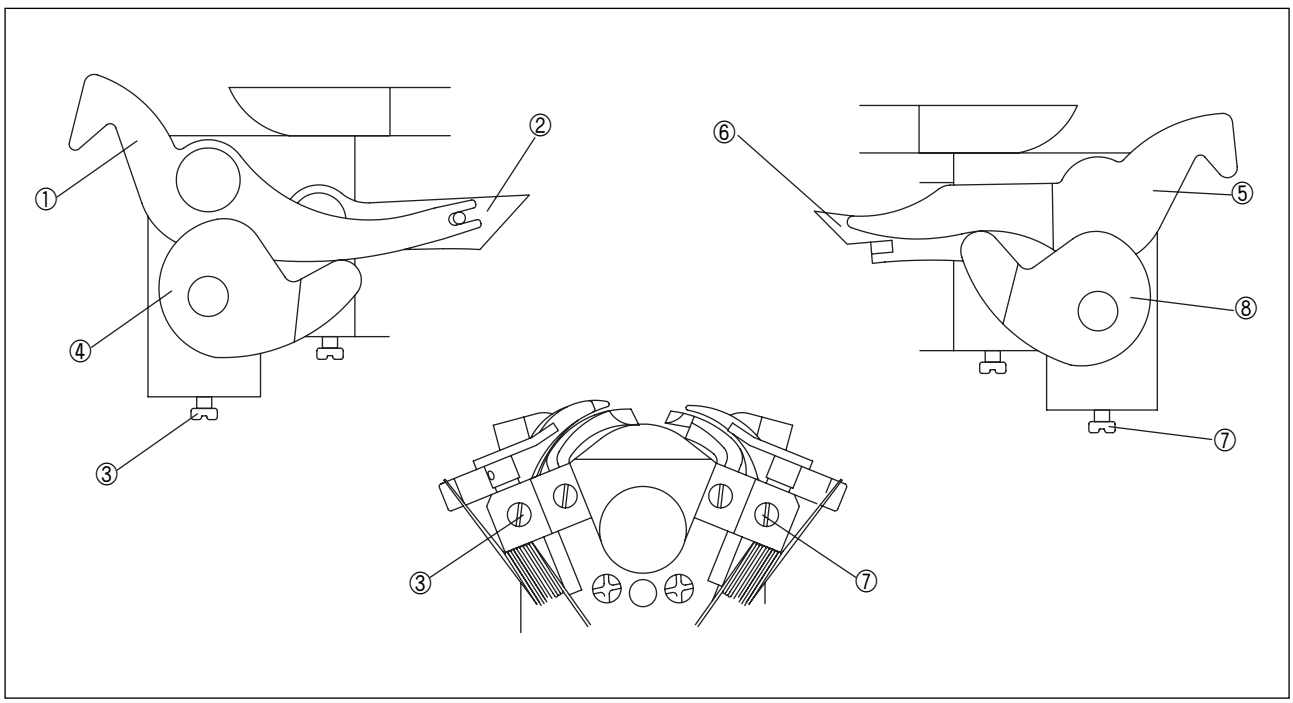


[Fig. 33]

7) Adjust the position of spreader

A. Loosen the screw③ and adjust the spreader stopper (left)④ to make the fork of the spreader(left) ① meet the lower thread guide hole of the looper(left)②.

B. Loosen the screw⑦ to make the both ends of the spreader (right)⑤ and the looper (right)⑥ located at the same place, and adjust the position of the spreader stopper(right)⑧.

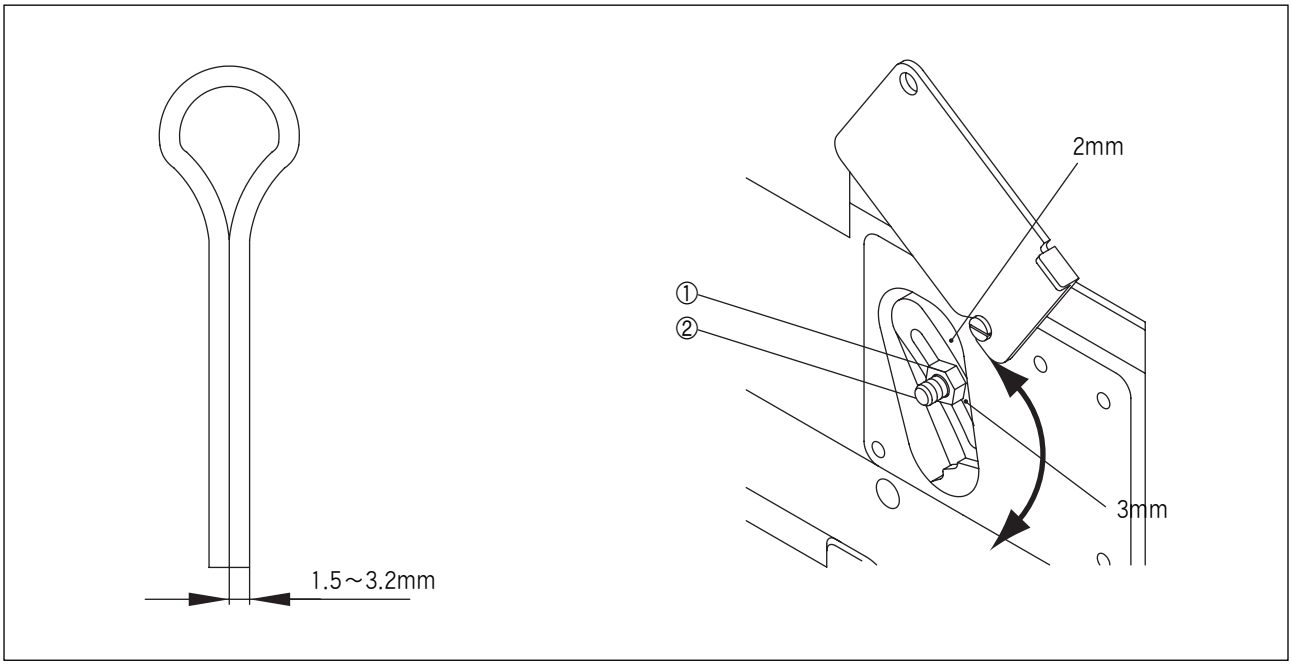


[Fig. 34]

8) Adjust stitch length

A. Release the nut for needle vibration control① and move the adjusting nut② up and down along the oval groove in order to change stitch length.

B. When the adjusting nut moves up, the stitch length gets narrower and vice versa. (When shipped out from factory, the default stitch length is 2.5mm).

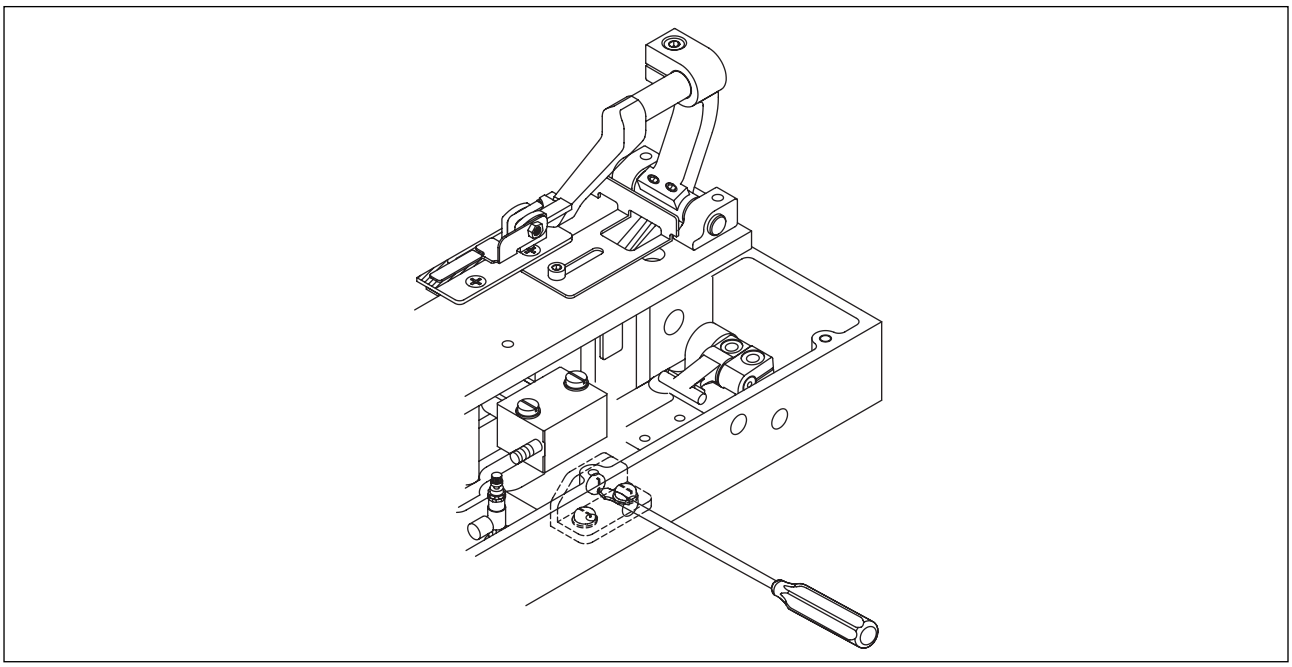


[Fig. 35]

9)Adjust cloth opening

A. Loosen the screw and insert a driver through the side groove of the X-Y transfer base. Turn the adjusting screw for size adjustment.

B. Tighten the screw and measure the size of the opening (0.8mm is ideal).

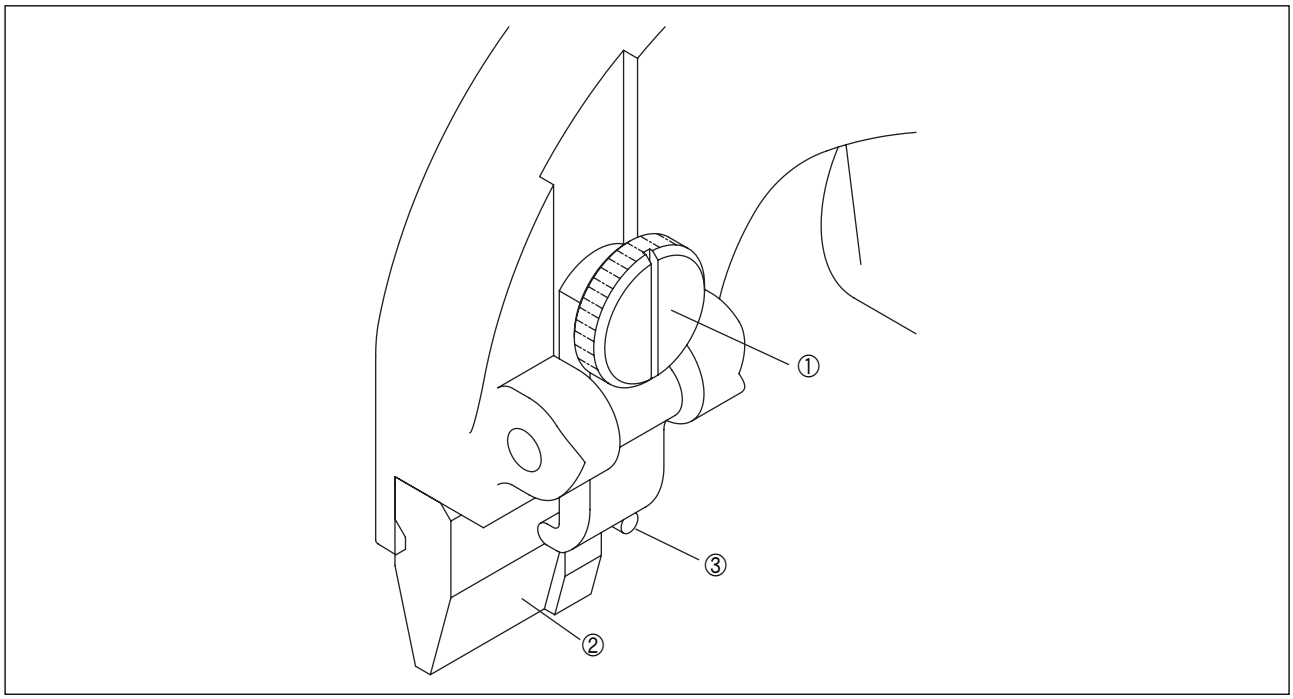


[Fig. 36]

10) Replace hammer

A. Loosen the screw① and remove the hammer②.

B. Push new hammer into the pin③ and tighten the screw①.

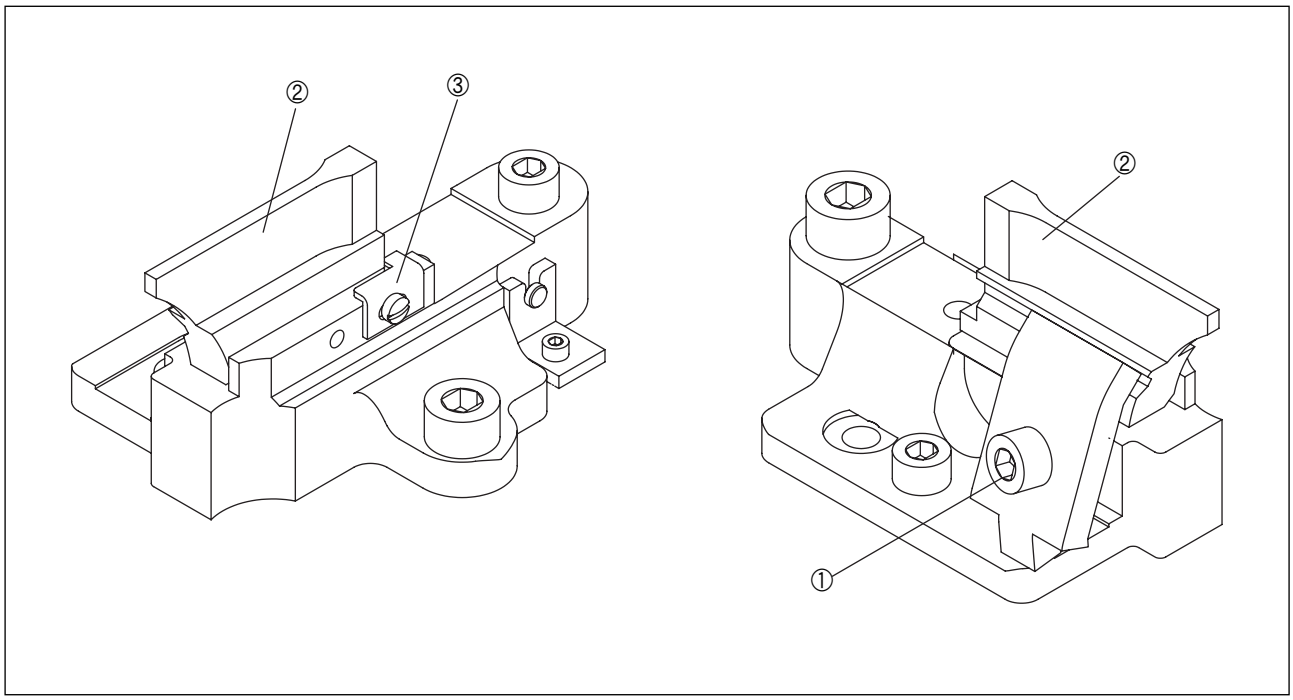


[Fig. 37]

11) Replace cutter

A. Loosen the screw① and remove the cutter②.

B. Insert new cutter into the cutter stopper③ and fasten the screw①.

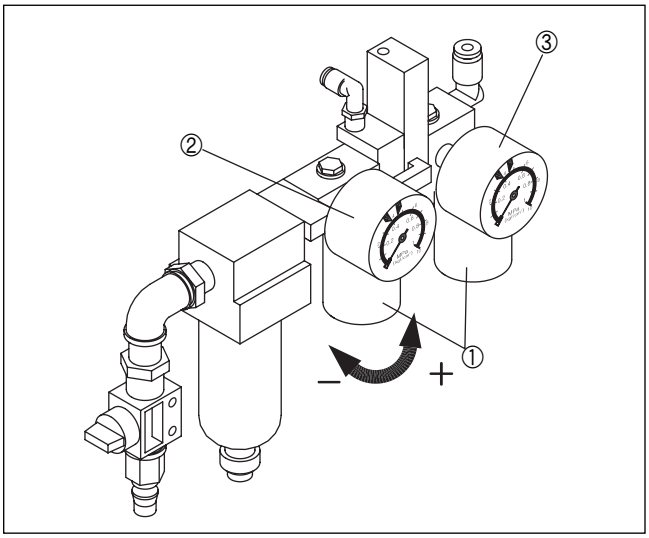


[Fig. 38]

12) Adjust air pressure

A. As shown in the figure, pull down the adjusting handle ① at the bottom of the filter adjuster which is attached to the lower part of the table. If it is turned to the right side, the air pressure goes up. If it is turned to the left side, the air pressure goes down. Change the air pressure to the appropriate level as displayed on the pressure gauge and then put the adjusting handle① back to its original position.

B. Set the pressure of the main adjusting device② at 0.5MPa and that of the cutter adjusting device③ at 0.3MPa.

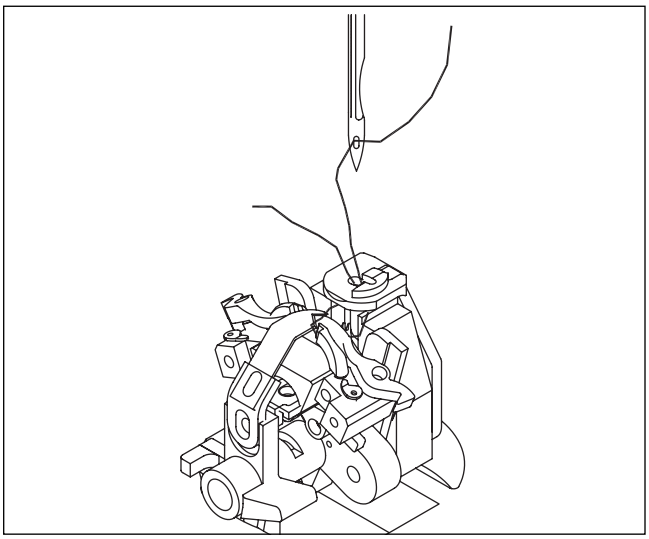


[Fig. 39]

13) Adjust upper thread trimming

A. -01 Model

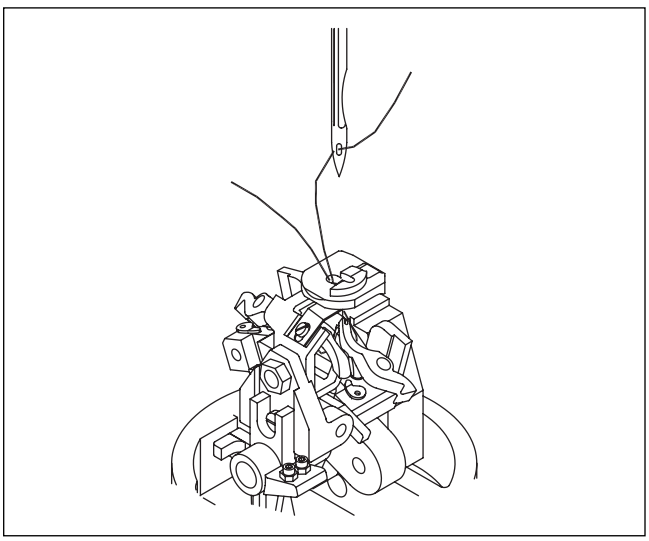
ⓐ Adjust the upper thread trimming mes to cut only one among the threads in front of the looper(right).



[Fig. 40]

B. -02 Model

ⓐ Adjust the upper thread trimming mes to cut only one among the threads in front of the looper (right).



[Fig. 41]

14) Adjust thread trimming for lower thread and inside thread

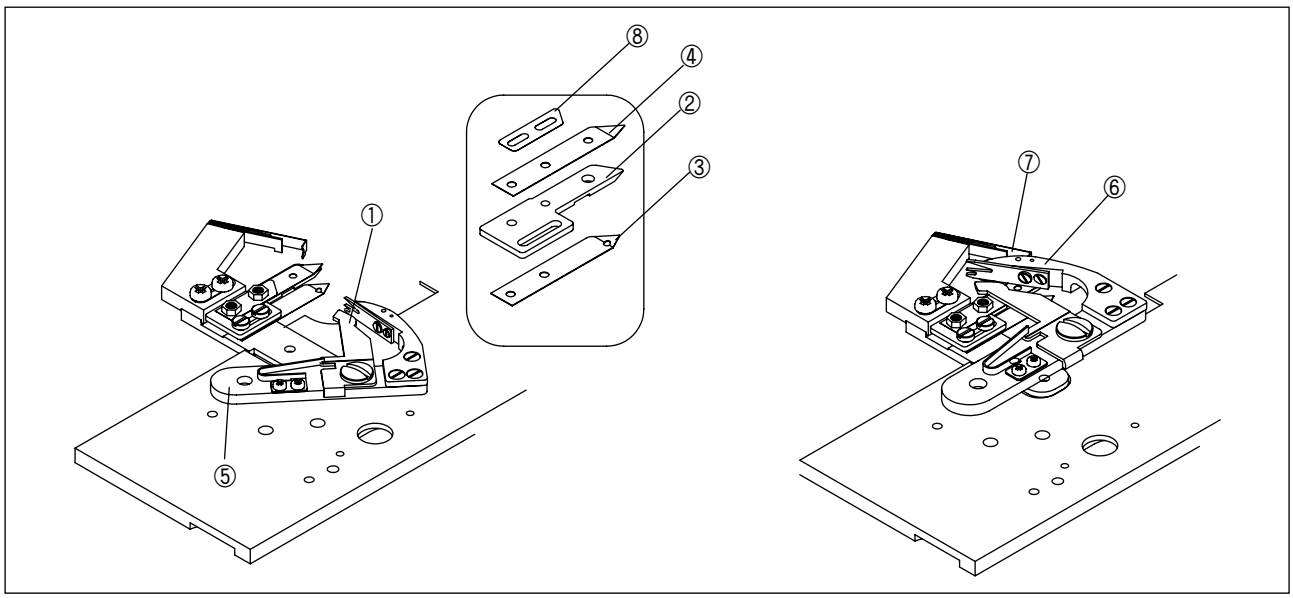
A. -01 Model

ⓐ The thread cover① separates the lower thread from the inside thread.

ⓑ The lower thread is fastened between the middle thread holder② and the lower thread holder③. The inside thread is fixed between the middle thread holder② and the upper thread holder④.

ⓒ When the lower thread trimming arm⑤ is running at full speed, the punched mark⑥ of the lower thread trimming copper mes shall contact the end ⑦ of the lower thread trimming fixed mes.

ⓓ If the thread holder (upper)④ and the thread holder (center)② are separated, make them closely located by adjusting the thread holder (upper) washer⑧ back and forth.

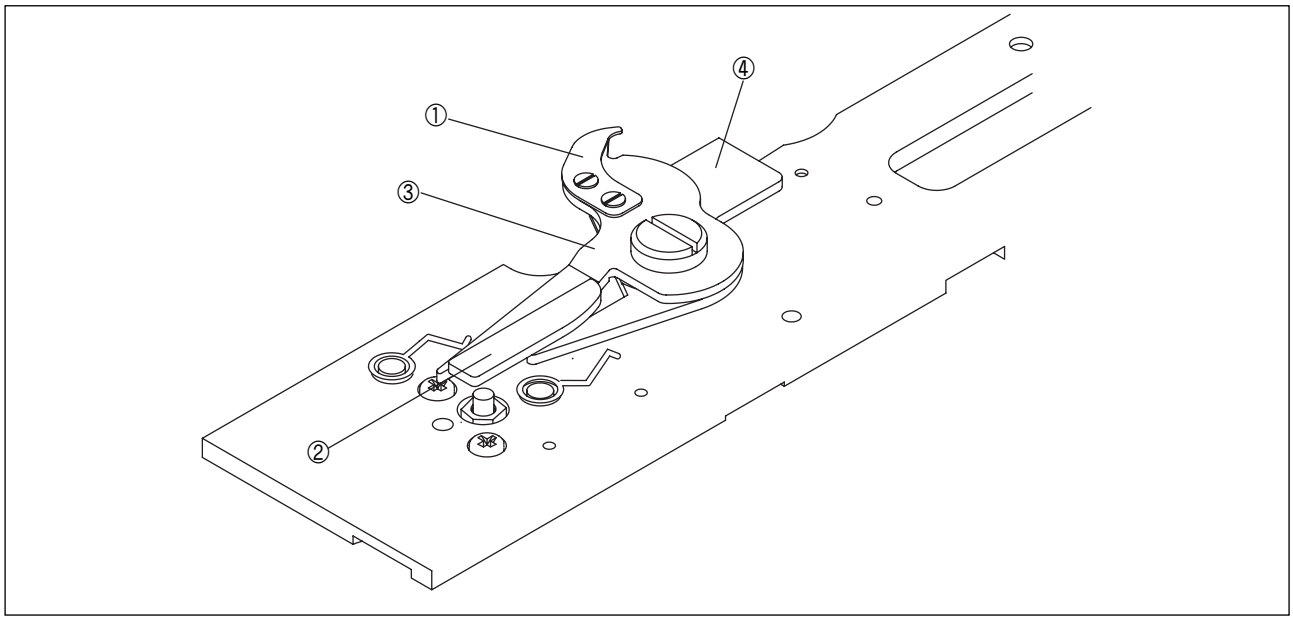


[Fig. 42]

B. -02 Model

ⓐ Use the thread cover① to separate the lower thread from the inside thread.

ⓑ When the copper mes drive cam② starts running, the left③ and right④ copper meses get dovetailed and the thread will be cut.

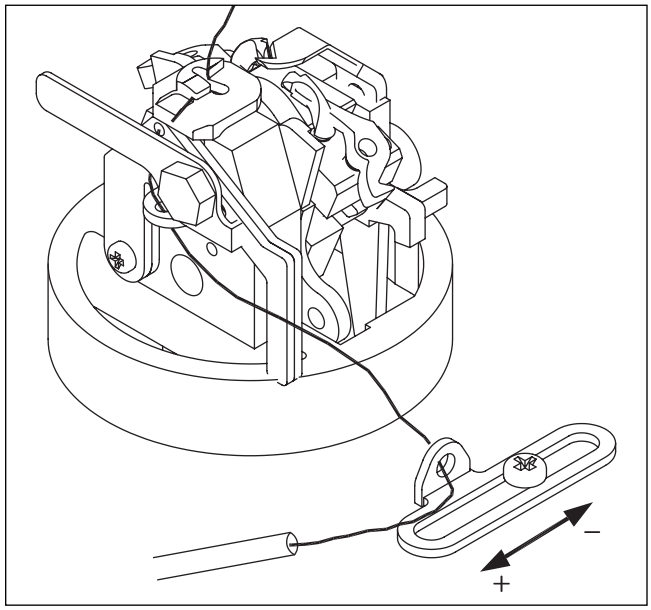


[Fig. 43]

15) Adjust the length of inside thread after thread trimming (-02 Model)

A. The 4mm projection of the inside thread from the throat plate is appropriate.

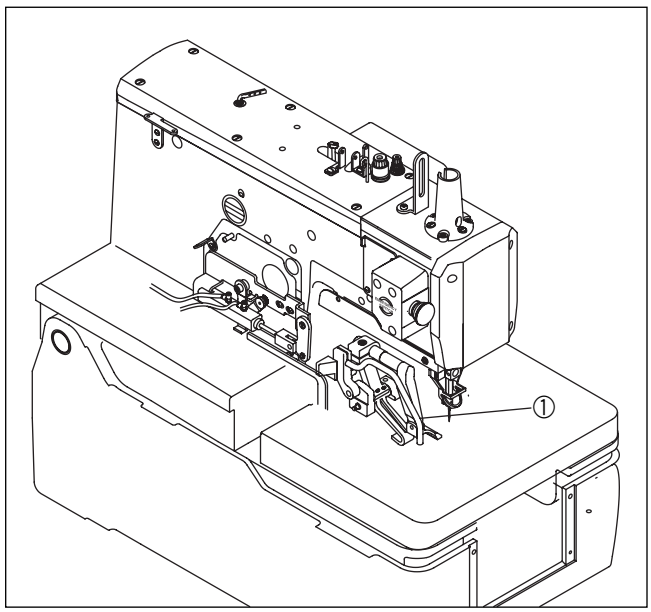
B. Unfasten the screw and move the inside thread guide in the direction of the arrow for length adjustment.



[Fig. 44]

16) Auxiliary clamp arm (-02 Model)

When the clamp moves up, the trimming of the lower thread and the inside thread begins. In order to ensure that sufficient thread is left after thread trimming, the auxiliary clamp prevents sewing cloth from moving during thread trimming.



[Fig. 45]

7

Troubleshooting

Check out the followings before calling the service center for repair.
If the following measures to fix problems do not work, turn off the power and inquire the distributor from whom you purchased the machine.

Danger	• Turn the power off and pull the plug off before taking measures. • If the hand switch is pressed by accident, it could cause injuries.

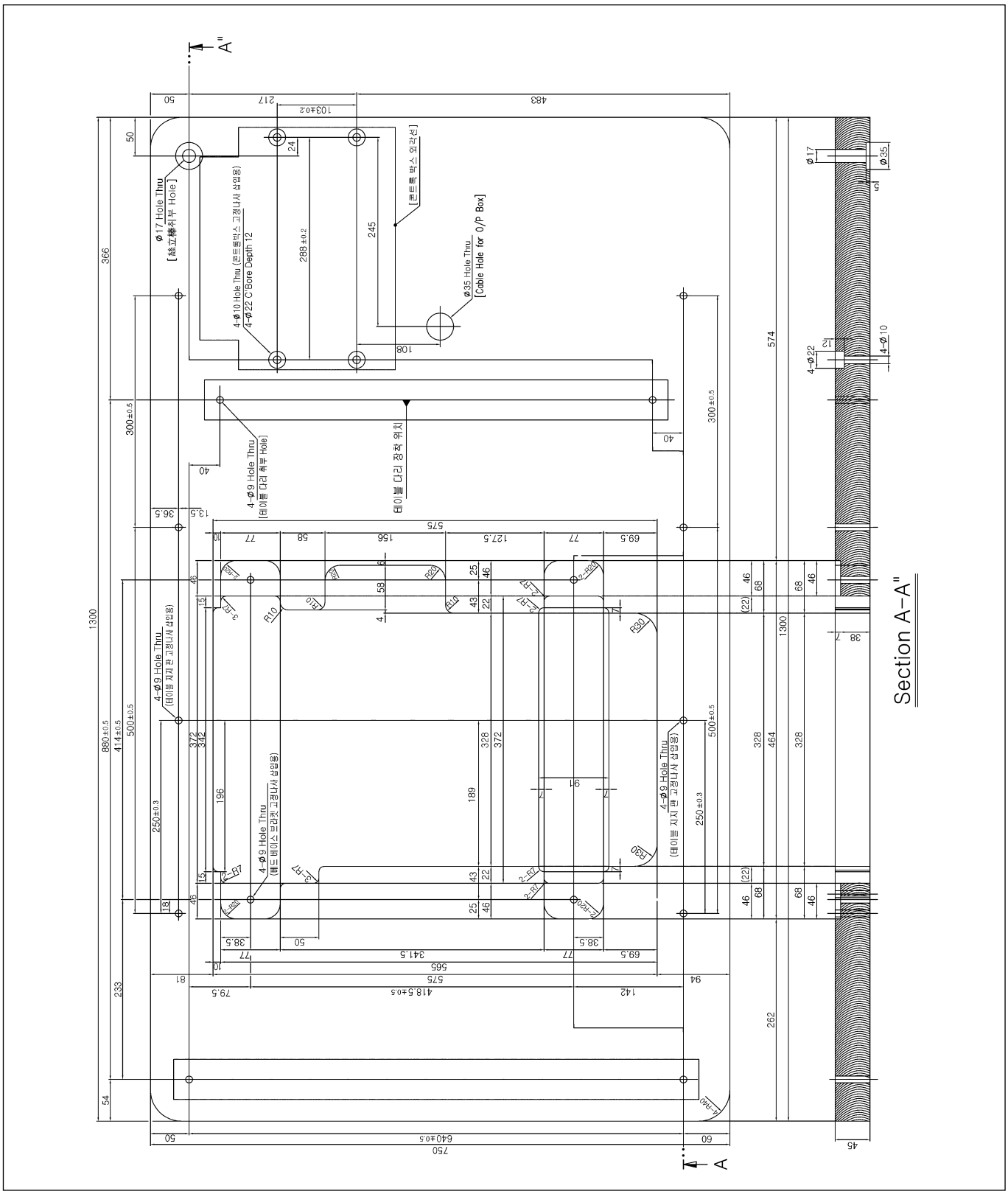
No.	Problem	Cause	Solution
1	Problem in launching and operating the machine	Excessive relaxation of belt tension or belt damage	Adjust belt tension and replace the belt
		Power or circuit fuse disconnection	Check the disconnection of the main shaft motor drive fuse inside the control box and replace it.
2	Bad stopping position	Relaxed main drive belt	Adjust belt tension
		Wrong position of the lower shaft sensor plate or defective adjacent sensor	Adjust the position of the lower shaft sensor plate or replace the adjacent sensor
3	Needle break	Needle placed at wrong place	Place needle at right place
		Needle contacts looper and needle guard	Adjust the space between needle, looper and needle guard.
4	Thread break	The tension of the thread adjusting device is either excessive or weak	Adjust spring tension properly
		Damaged needle (Needle is curved or the needle hole or groove is damaged or the tip of needle is worn out or deformed)	Replace the needle
		Needle and looper are not properly adjusted	Adjust either the height of the needle stand or the height of the looper and spreader
		Damage in looper, throat plate or thread route-related parts	Repair the damage or replace the damaged parts
5	Stitch skipping	The curved needle is used	Replace the needle
		The tension of the thread adjusting device' s spring is either too excessive or weak	Adjust the spring tension properly
		The distance of the needle and the looper is different	Adjust the distance of the needle and the looper
		The distance of the needle and the needle guard is different	Adjust the distance of the needle and the needle guard
		The tip of the looper is worn out	Repair the damaged looper or replace it.

No.	Problem	Cause	Solution
6	Error in upper thread trimming	The blade groove of the upper thread trimming copper mes is worn out	Replace it with a new one
		The weak air pressure of the upper thread trimming cylinder prevents proper operation of the upper thread trimming copper mes	Adjust air pressure
		The wrong placement of the upper thread trimming copper mes	Correct its position
7	Error in lower thread trimming	The lower thread trimming copper mes and the groove of the fixed mes' blade are worn out	Replace them with the new ones
		The weak air pressure of the lower thread trimming cylinder prevents proper operation of the upper thread trimming copper mes	Adjust air pressure
		Wrong placement of the lower thread trimming copper mes	Put it at the right position
8	Defect in cloth cutting	The cutter pressure is weak	Adjust the cutter pressure
		The poor contact of cutter and hammer	Grind the surface of the hammer
		The blade of the cutter is worn out	Replace the cutter

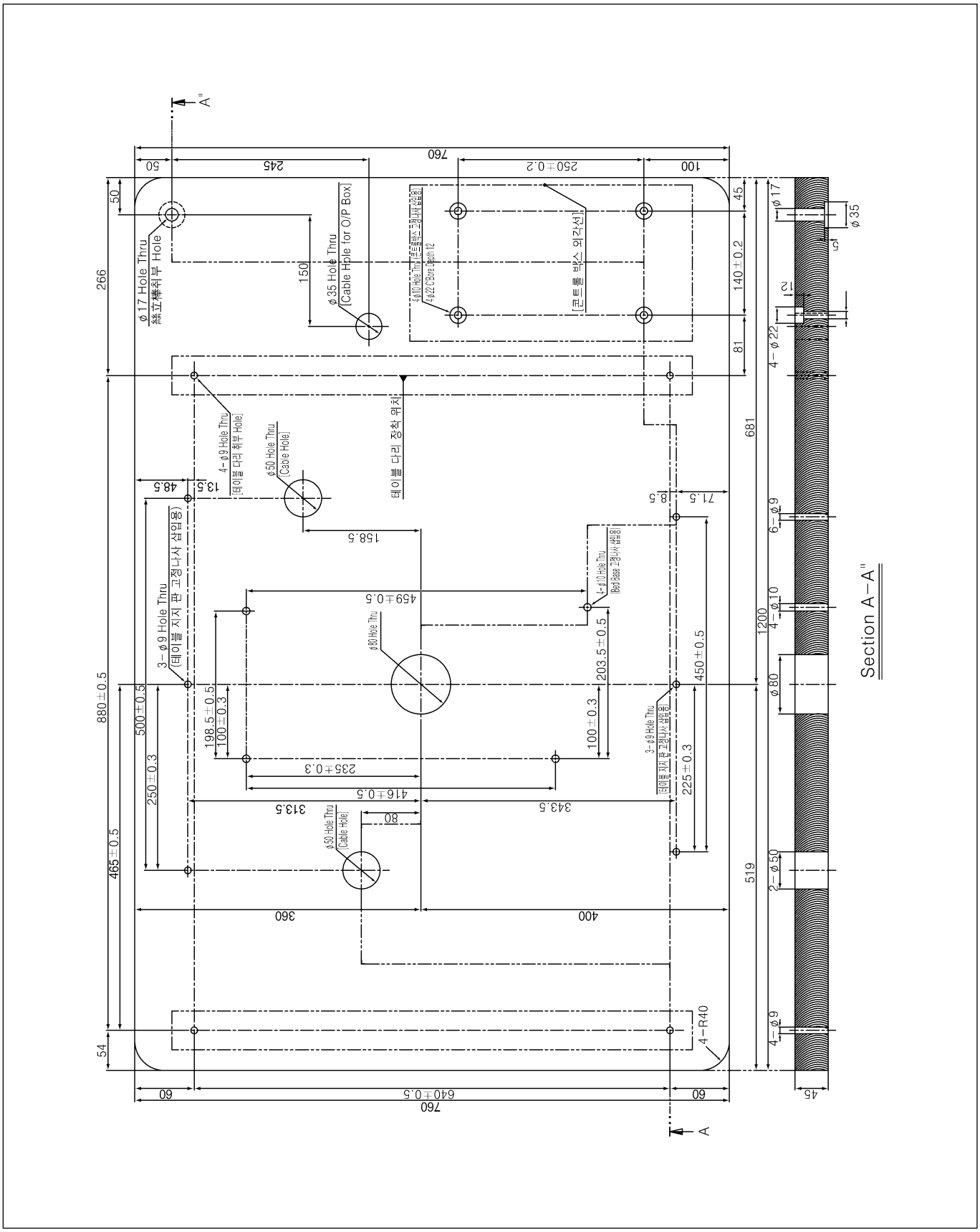
8

Table Drawings

1) Basic



2) Optional (Mountable on the table)

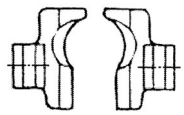
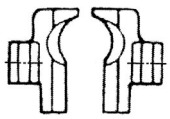
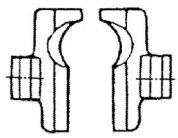
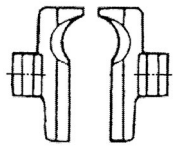


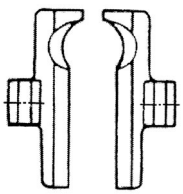
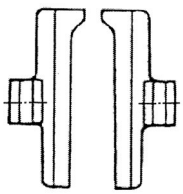
9

Gauge List

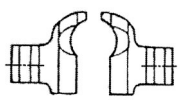
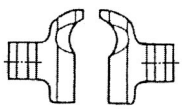
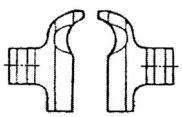
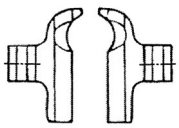
1) Clamp

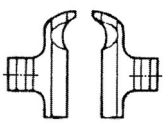
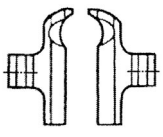
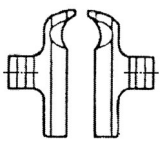
-01

10~18mm	18~22mm	22~26mm	26~30mm
			
L : GP-002210	L : GP-002212	L : GP-002214	L : GP-002216
R : GP-002211	R : GP-002213	R : GP-002215	R : GP-002217

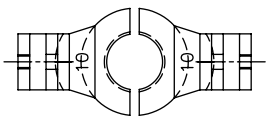
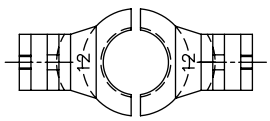
26~38mm	38mm
	
L : GP-000978	L : GP-002220
R : GP-000987	R : GP-002221

-02

A (14~18mm)	B (18~22mm)	C (22~26mm)	D (26~30mm)
			
L : GP-002244	L : GP-002246	L : GP-001694	L : GP-002248
R : GP-002245	R : GP-002247	R : GP-001695	R : GP-002249

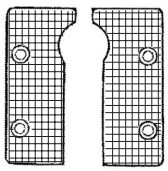
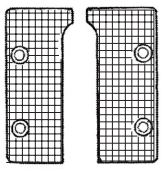
E (28~32mm)	F (32~36mm)	G (36~40mm)
		
L : GP-002250	L : GP-002252	L : GP-002254
R : GP-002251	R : GP-002253	R : GP-002255

Circular Hole

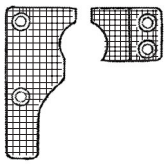
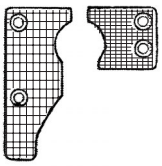
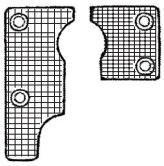
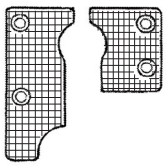
ϕ5	ϕ7
	
L : GP-007887	L : GP-011923
R : GP-007889	R : GP-011924

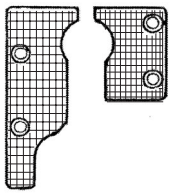
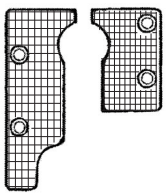
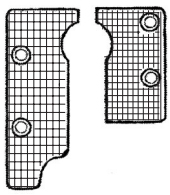
2) Needle Plate

-01

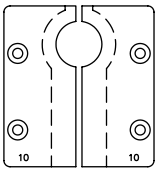
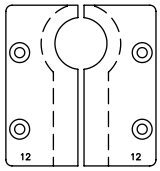
38mm	38mm
	
L : GP-000977	L : GP-002228
R : GP-000986	R : GP-002229

-02

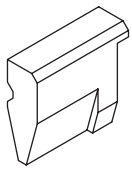
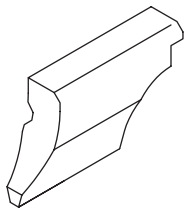
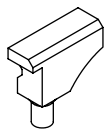
A (14~18mm)	B (18~22mm)	C (22~26mm)	D (26~30mm)
			
L : GP-002232-02	L : GP-002234-02	L : GP-001690-03	L : GP-002236-02
R : GP-002233-02	R : GP-002235-02	R : GP-001689-02	R : GP-002237-02

E (28~32mm)	F (32~36mm)	G (36~40mm)
		
L : GP-002238-02	L : GP-002240-02	L : GP-002242-02
R : GP-002239-02	R : GP-002241-02	R : GP-002243-02

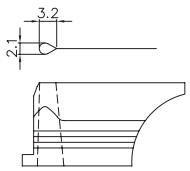
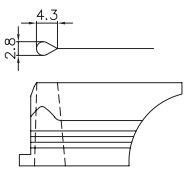
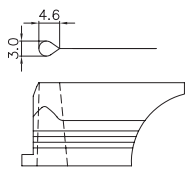
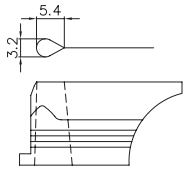
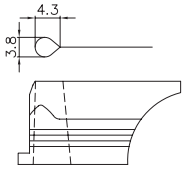
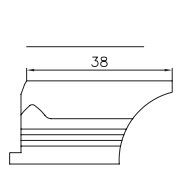
Circular Hole

ϕ5	ϕ7
	
L : GP-007890	L : GP-011921
R : GP-007892	R : GP-011922

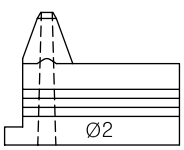
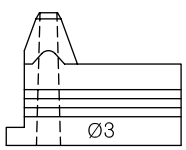
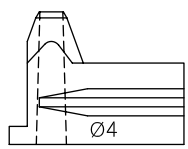
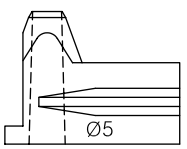
3) Hammer

-01	10mm	12mm	14mm	16mm	
	GP-002268	GP-002269	GP-002270	GP-002271	
	18mm	20mm	22mm	24mm	
	GP-002272	GP-001018	GP-002273	GP-002274	
	26mm	28mm	30mm	32mm	
	GP-001019	GP-002275	GP-002276	GP-002277	
	34mm	36mm	38mm		
	GP-002278	GP-002279	GP-001006		
-02	S10mm	S12mm	S14mm	S16mm	
	GP-002281	GP-002282	GP-002283	GP-002284	
	S18mm	S20mm	S22mm	S24mm	
	GP-002285	GP-001701	GP-002286	GP-001702	
	S26mm	S28mm	30mm	32mm	
	GP-002287	GP-002288	GP-002276	GP-002277	
	34mm	36mm	38mm		
	GP-002278	GP-002279	GP-001006		
Circular Hole	ϕ5		ϕ7		
	GP-007893		GP-011919		

4) Cutter

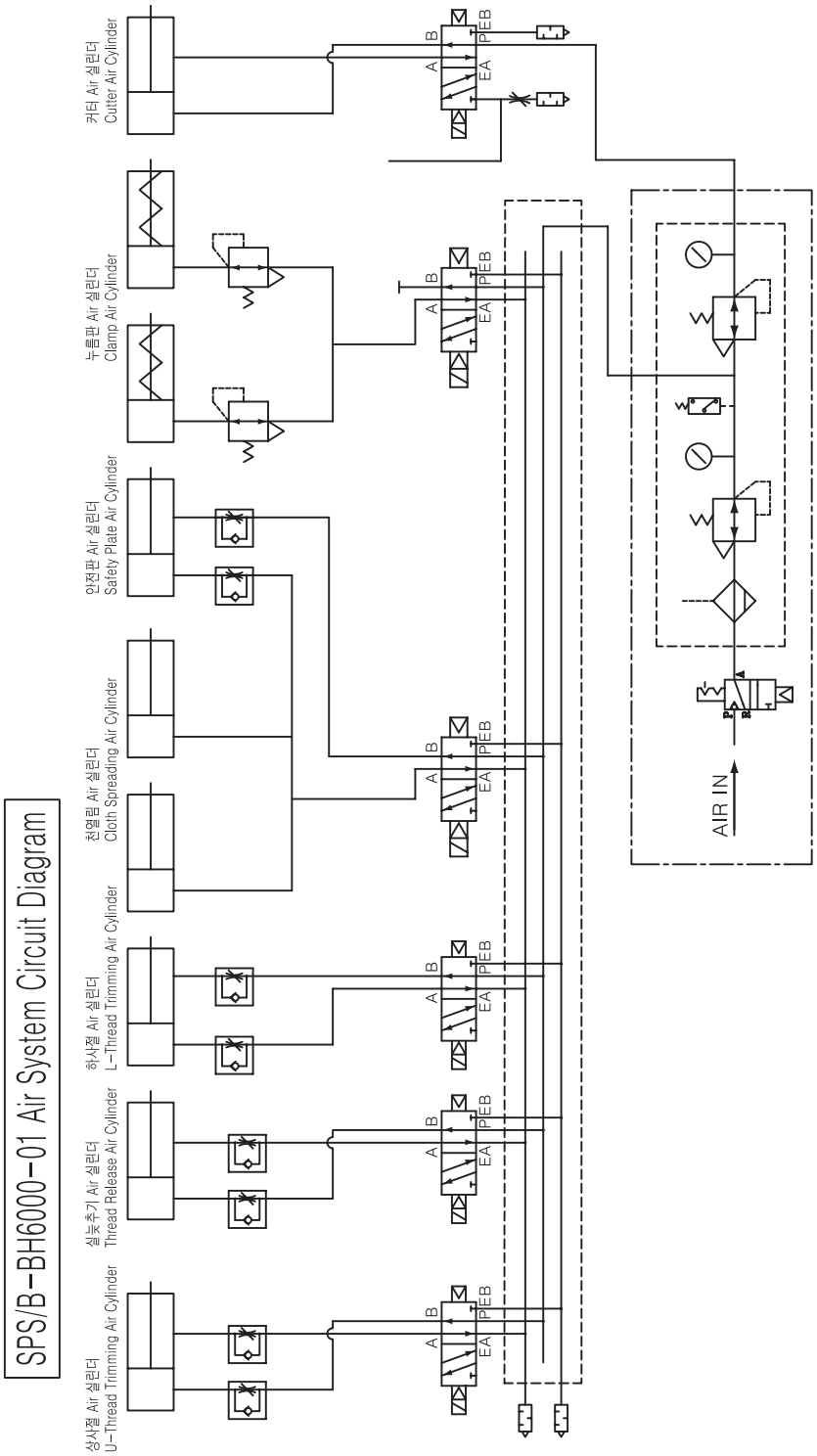
					
GP-002258	GP-001011	GP-002259	GP-002260	GP-002261	GP-002262

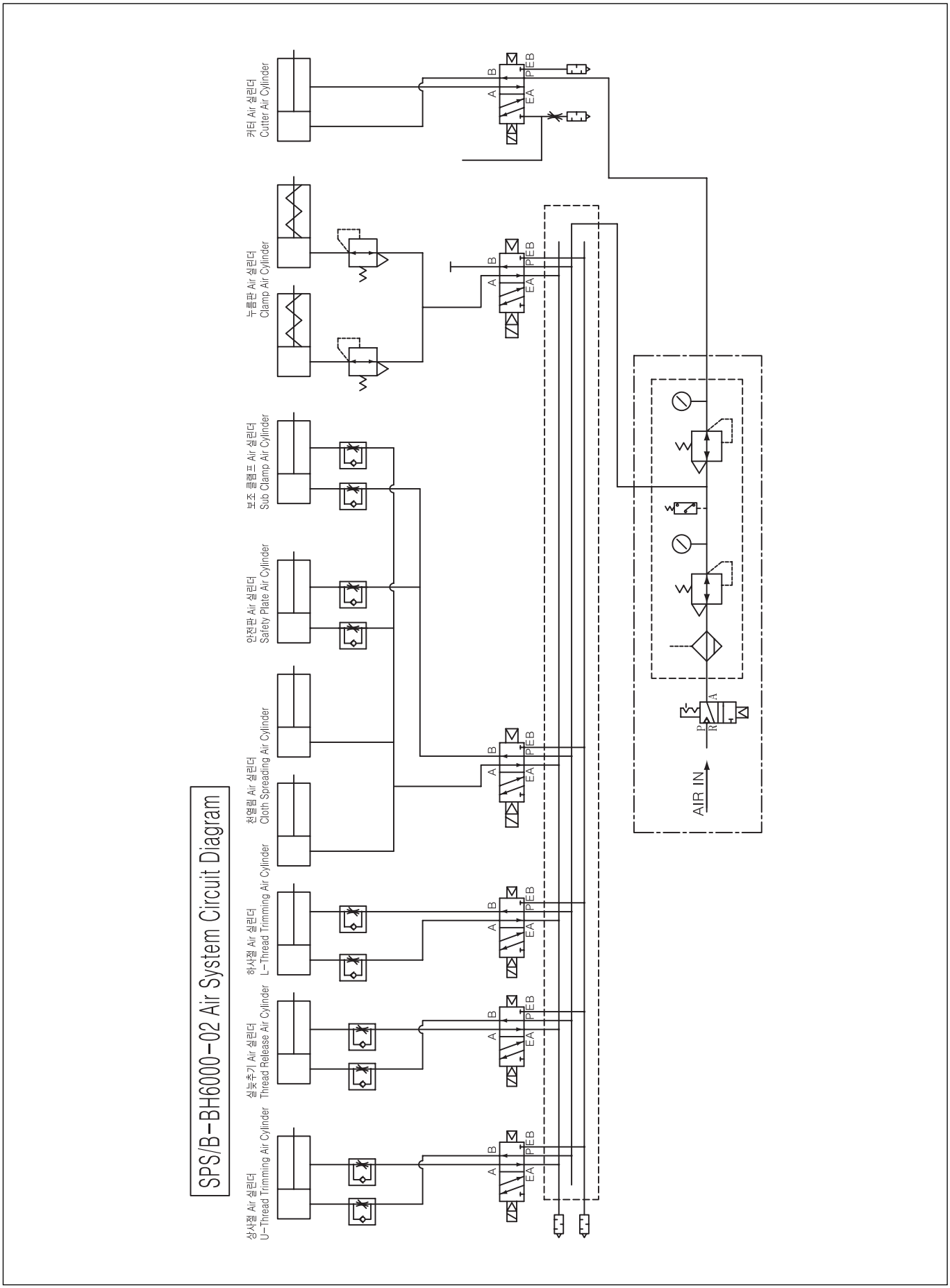
Circular Hole

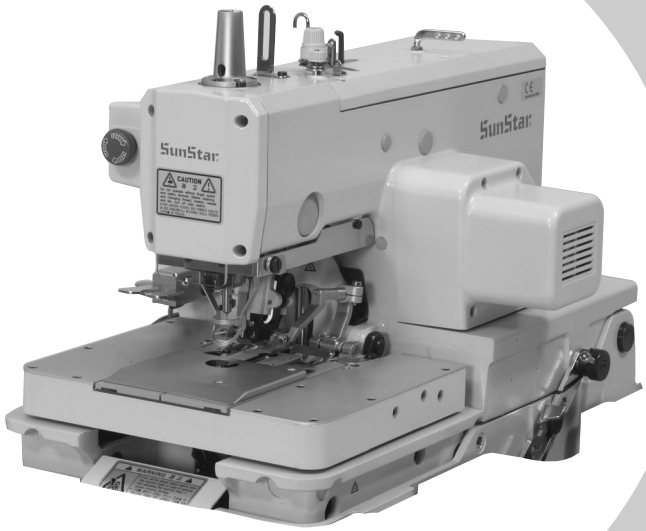
ϕ2	ϕ3	ϕ4	ϕ5
			
R : GP-011907	R : GP-007895	R : GP-007896	R : GP-011920

10

Air System Circuit Diagram




SPS/B-BH6000-02 Air System Circuit Diagram
삼사절 Air 실린더
U-Thread Trimming Air Cylinder
실늦추기 Air 실린더
Thread Release Air Cylinder
하사절 Air 실린더
L-Thread Trimming Air Cylinder
천열림 Air 실린더
Cloth Spreading Air Cylinder
안전판 Air 실린더
Safety Plate Air Cylinder
보조 클램프 Air 실린더
Sub Clamp Air Cylinder
누름판 Air 실린더
Clamp Air Cylinder
커터 Air 실린더
Cutter Air Cylinder
AIR IN
A
B
EA
PEB
P
R
A



Optional Devices

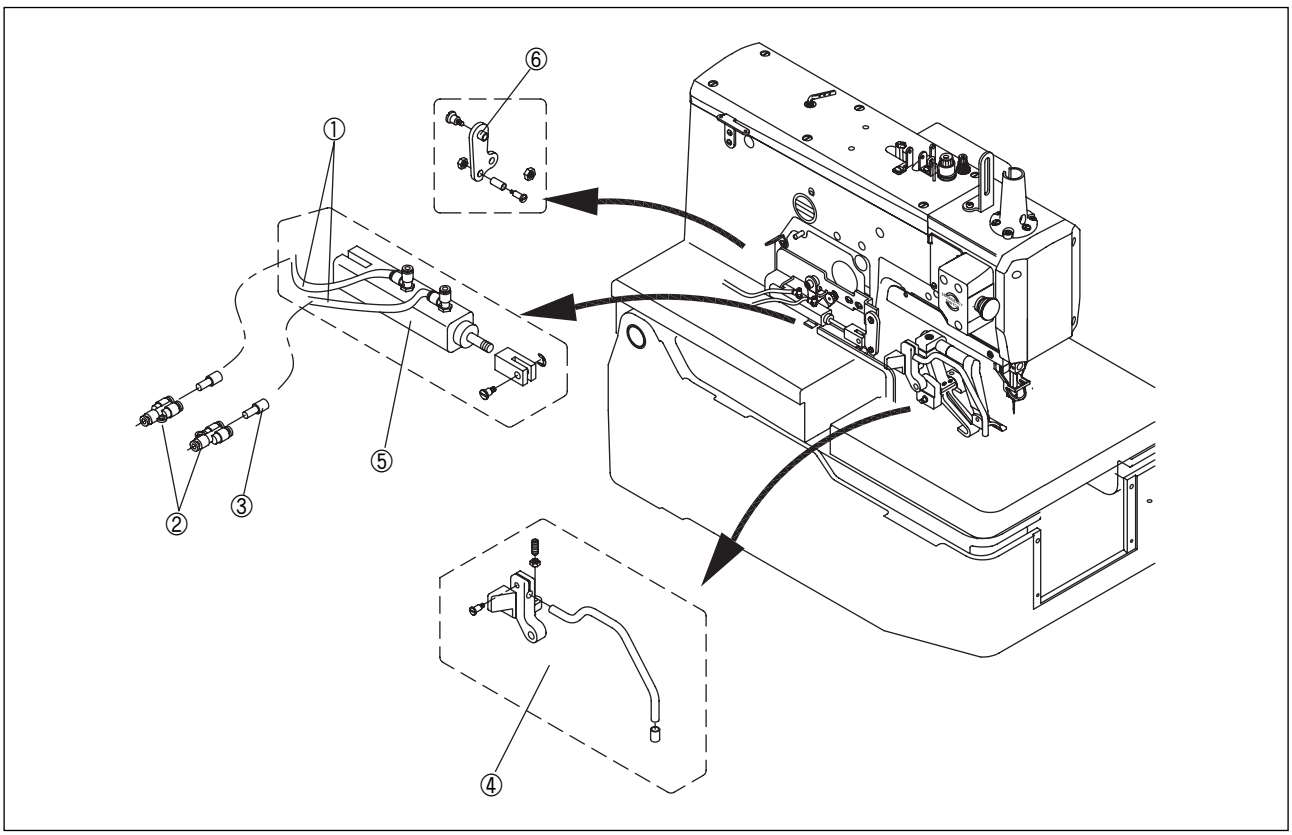
1

Fly Indexer

1) Install Fly Indexer

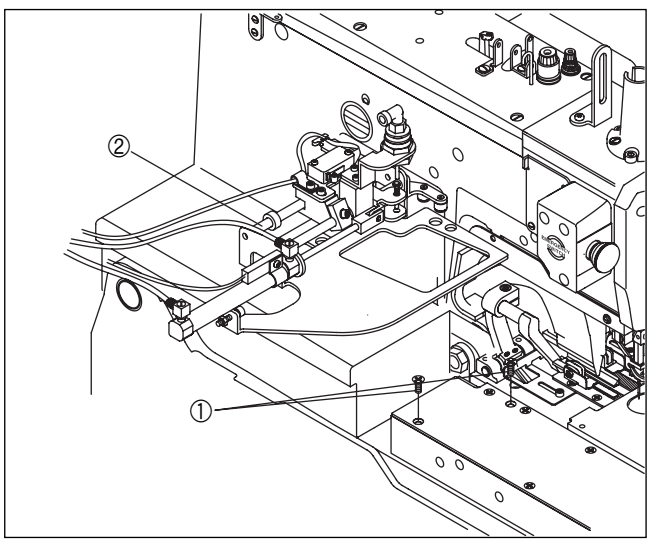
A. Installation

ⓐ Take out the air hose① and insert the plug③ into the joint②. Remove the auxiliary clamp arm④ and the operating cylinder⑤, clamp link⑥.



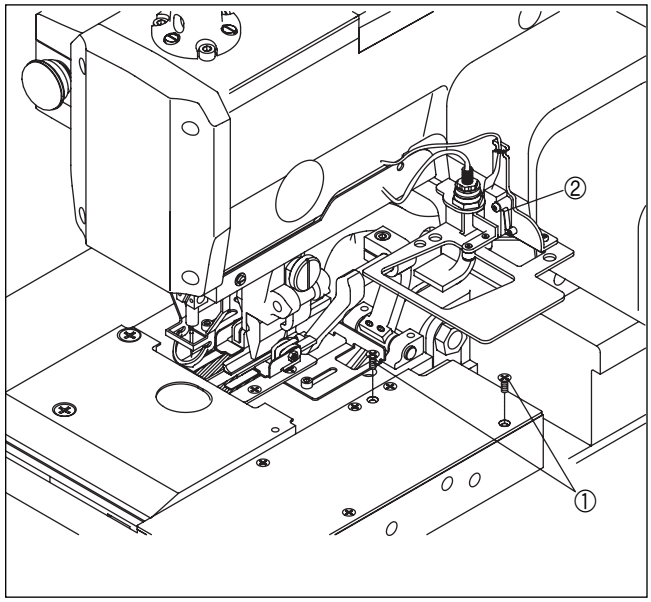
[Fig. 1]

ⓑ Remove the fastening screw (two screws)① of the transfer base cover (left) and install the transfer base (left)②.



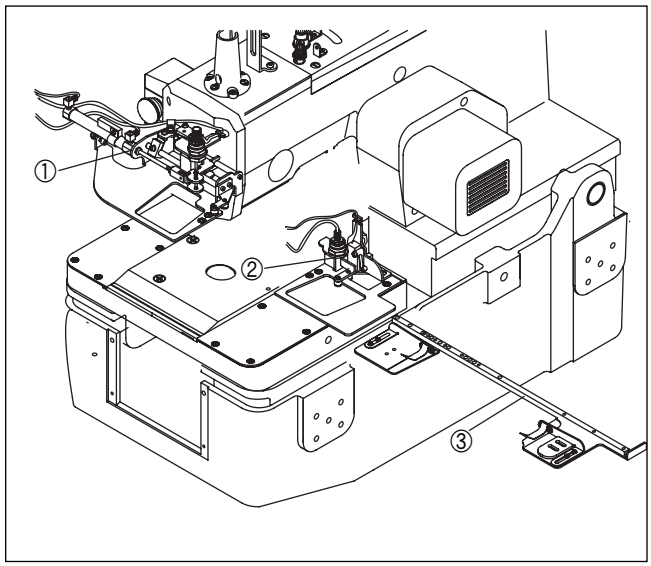
[Fig. 2]

ⓒ Remove the fastening screws (two screws)① of the transfer base cover (right) and install the transfer base (right)②.



[Fig. 3]

ⓓ Insert the cloth transfer bar between the rollers of the cloth transfer guides (left & right)①, ②.



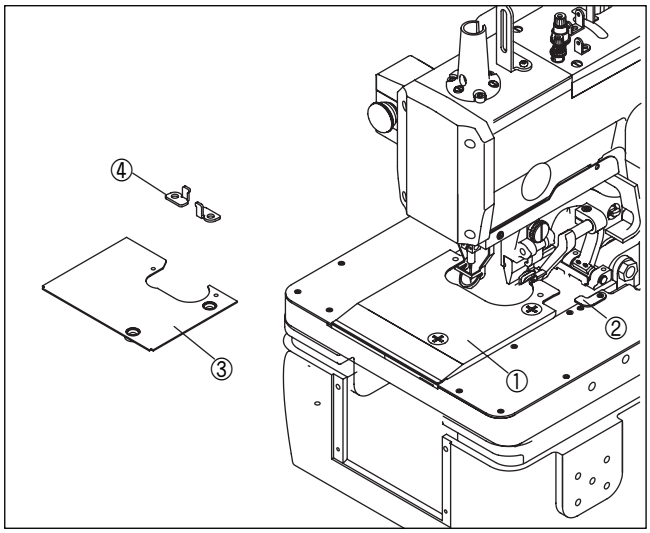
[Fig. 4]

[CAUTION]

Make sure whether the transfer pin slides smoothly into all the holes of the cloth transfer bar. If it is not smooth, adjust the position of the left and right transfer bases.

B. Replace the lower thread trimming cover plate and the press plate cover

Remove the currently installed lower thread trimming cover plate (B)① and the press plate cover②, and replace them with new lower thread trimming cover plate(C)③ and the press plate cover (B)④.



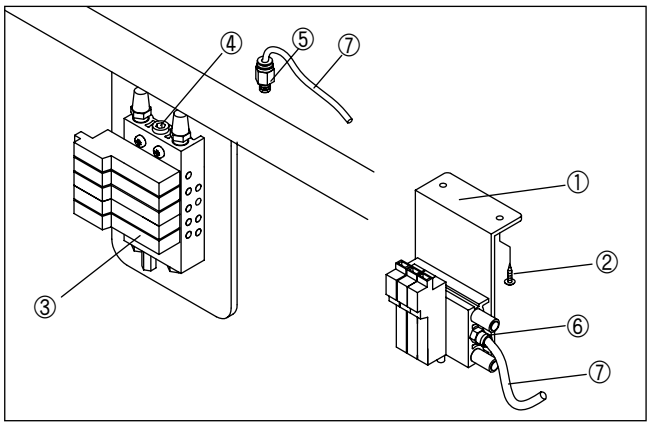
[Fig. 5]

C. Install solenoid valve

ⓐ Install the manifold bracket① on the lower part of the table using the screw②.

ⓑ Remove the plug④ of the main solenoid valve③ and attach the joint⑤.

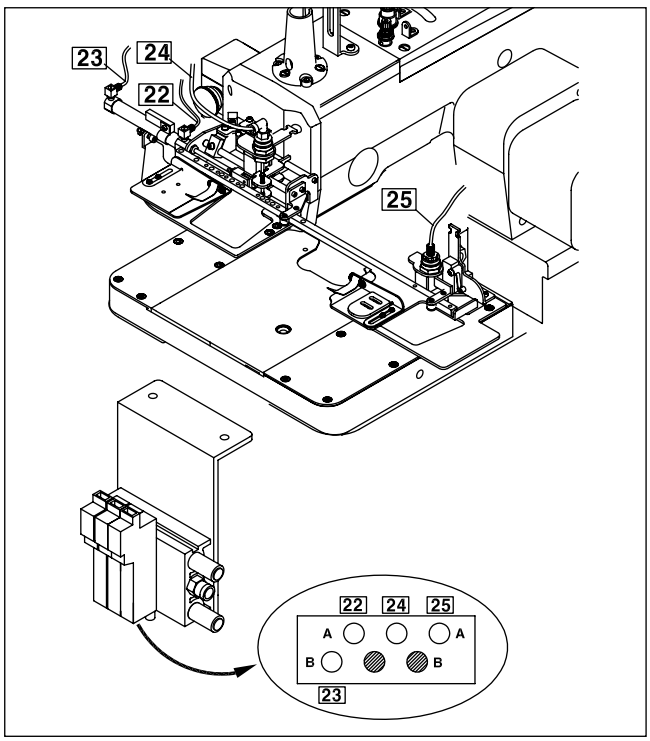
ⓒ Use the air hose⑦ (ϕ 6) to connect the joint⑤ and the nipple⑥.



[Fig. 6]

D. Connect air hoses

Air hoses can be connected to the solenoid valve respectively as shown in this figure.

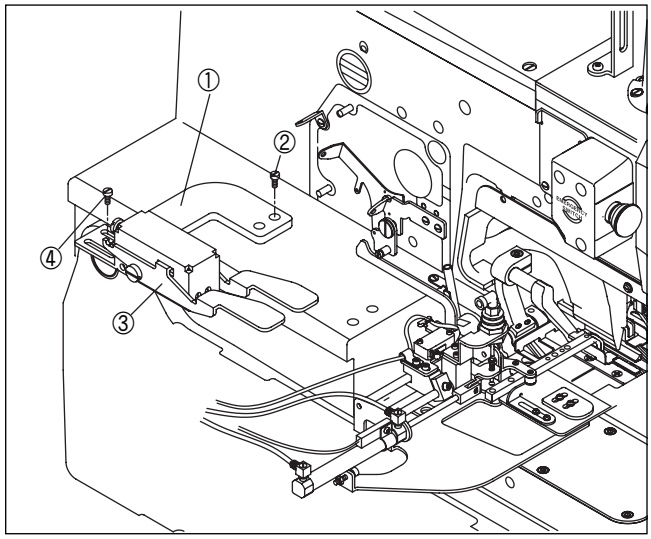


[Fig. 7]

E. Install hand switch

ⓐ Install the supporting plate of the hand switch① on the bed by using the screw②.

ⓑ Install the hand switch③ on the supporting plate①.



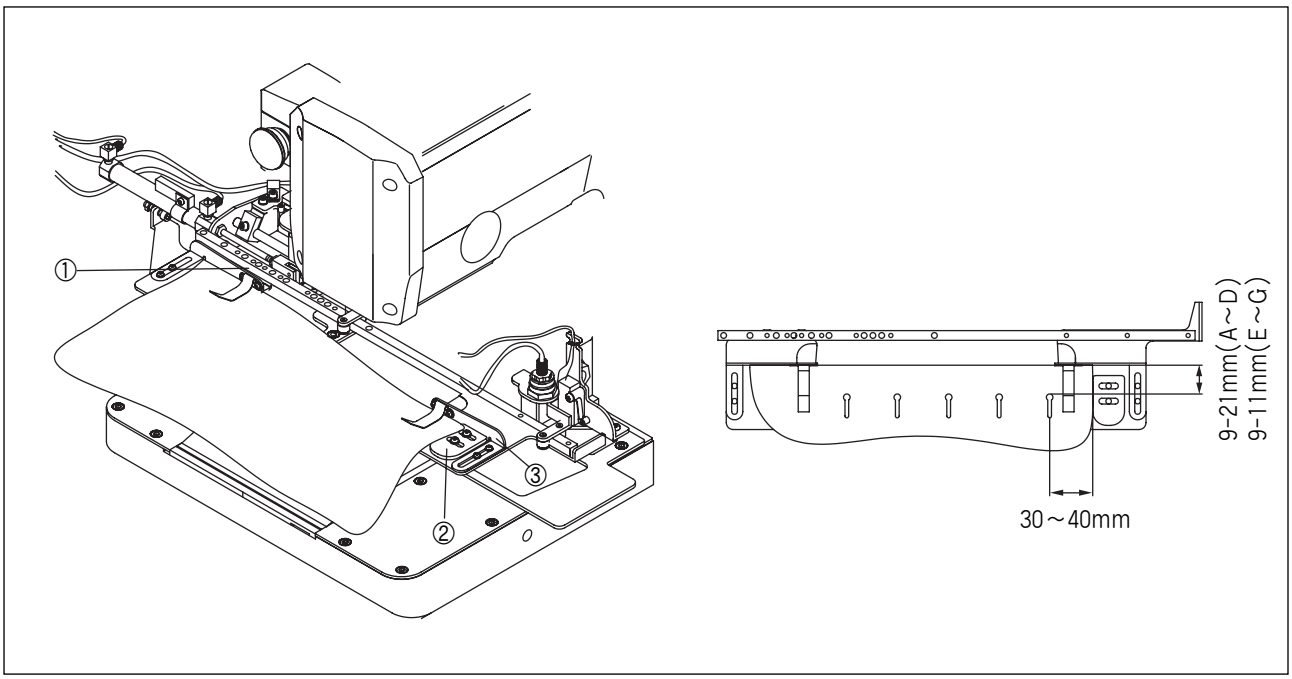
[Fig. 8]

2) Adjust sewing margin

ⓐ Insert the sewing material until it reaches the left① and right② cloth setting guides. Make sure that the end of the sewing material touches the left end of the cloth setting guide③.

ⓑ Loosen the fastening screw to adjust the position of the cloth setting guides (left, right), and set the vertical sewing margin at either 9~21mm (A~D) or 9~11mm (E~G).

ⓒ Loosen the fastening screw to adjust the position of the cloth setting guides, and set the horizontal sewing margin at 30~40mm.

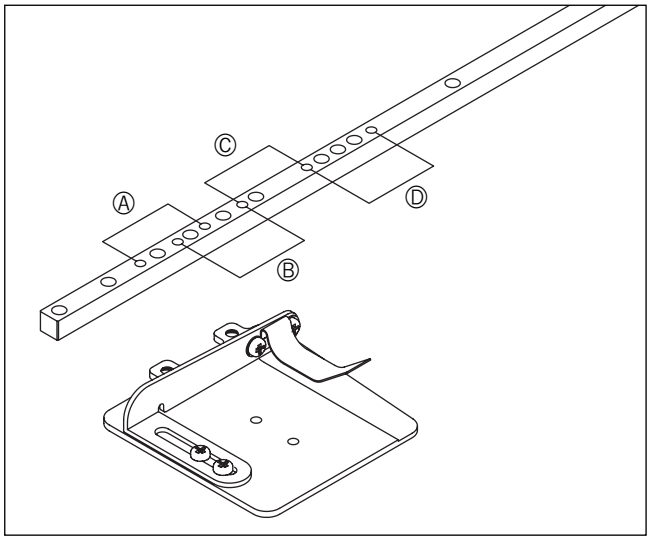


[Fig. 9]

3) Adjust the position of cloth transfer plate (left)

The position of the cloth transfer plate (left) is determined depending on the gap between holes and the number of holes. Refer to the table to install the cloth transfer plate.

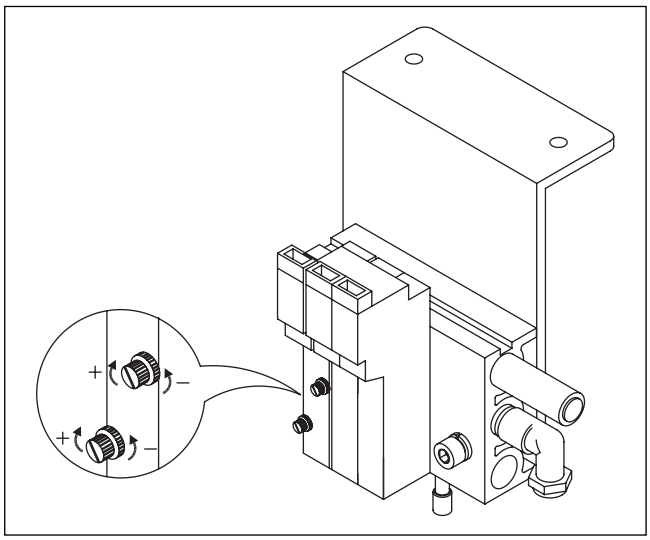
No. of Holes \ Gap	38.1mm	44.45mm	50.8mm
3	Ⓓ	Ⓓ	Ⓒ
4	Ⓒ	Ⓑ	Ⓐ



[Fig. 10]

4) Adjust the speed of cloth transfer

Turn the valve clockwise and the speed will increase. Turn the value counter-clockwise and the speed will decrease.

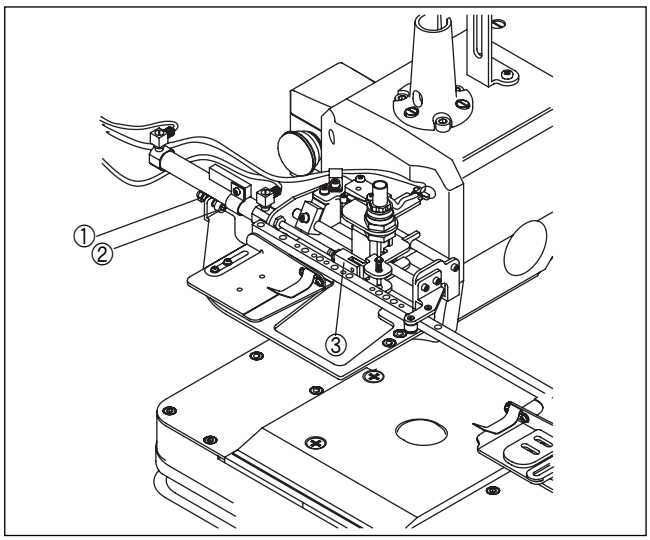


[Fig. 11]

5) Adjust the original position of cloth transfer bar

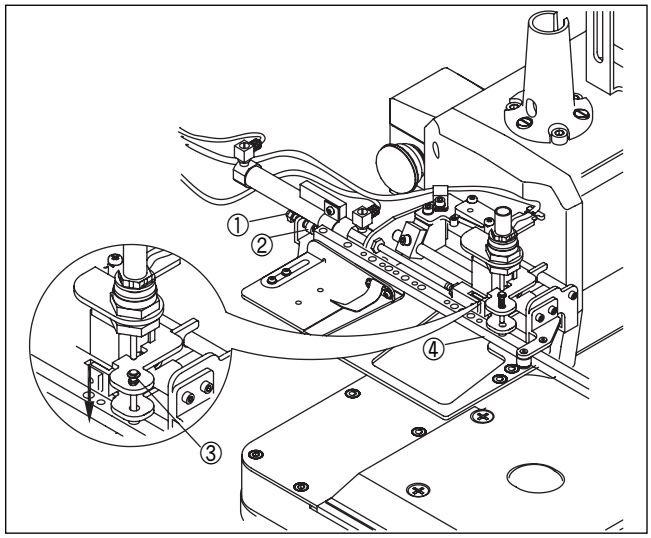
A. Loosen the nut① and move the bolt② to the left side.

B. Push the cylinder rod③ to the maximum level.



[Fig. 12]

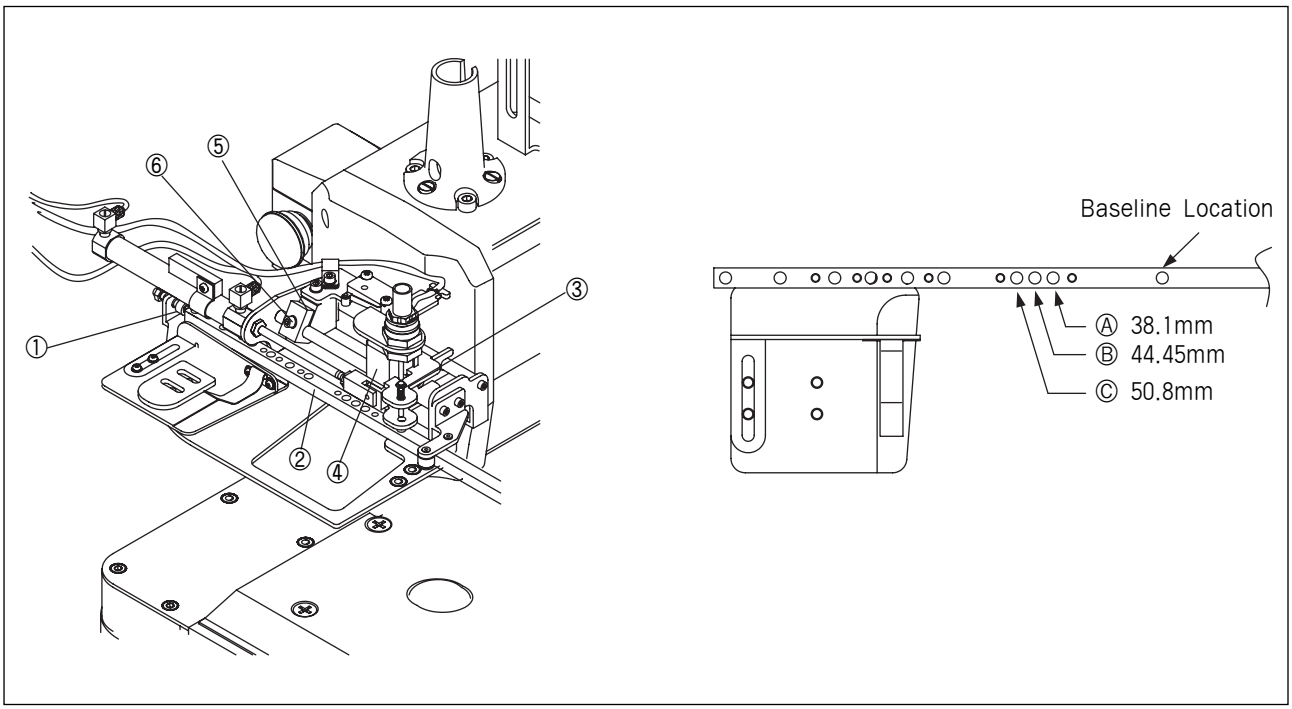
C. Insert the transfer pin① into the hole which indicates the original position of the cloth transfer bar.
D. Turn the bolt② to make it meet with the cloth transfer bar④.
E. Tighten the nut③ to fix the bolt②.
F. Check whether the transfer pin① smoothly slides into the original point after the cloth transfer bar touches the bolt.



[Fig. 13]

6) Adjust the gap between holes

A. Loosen the bolt①.
B. Push the cloth transfer bar② until it touches the stopper bolt①.
C. Move the transfer movement block④ to make sure of the smooth entering of the transfer pin③ into the indexer hole.
D. Make the stopper block⑤ touch the transfer movement block④ and tighten the bolt⑥ with the nut.



[Fig. 14]

7) Adjust limit switch (left)

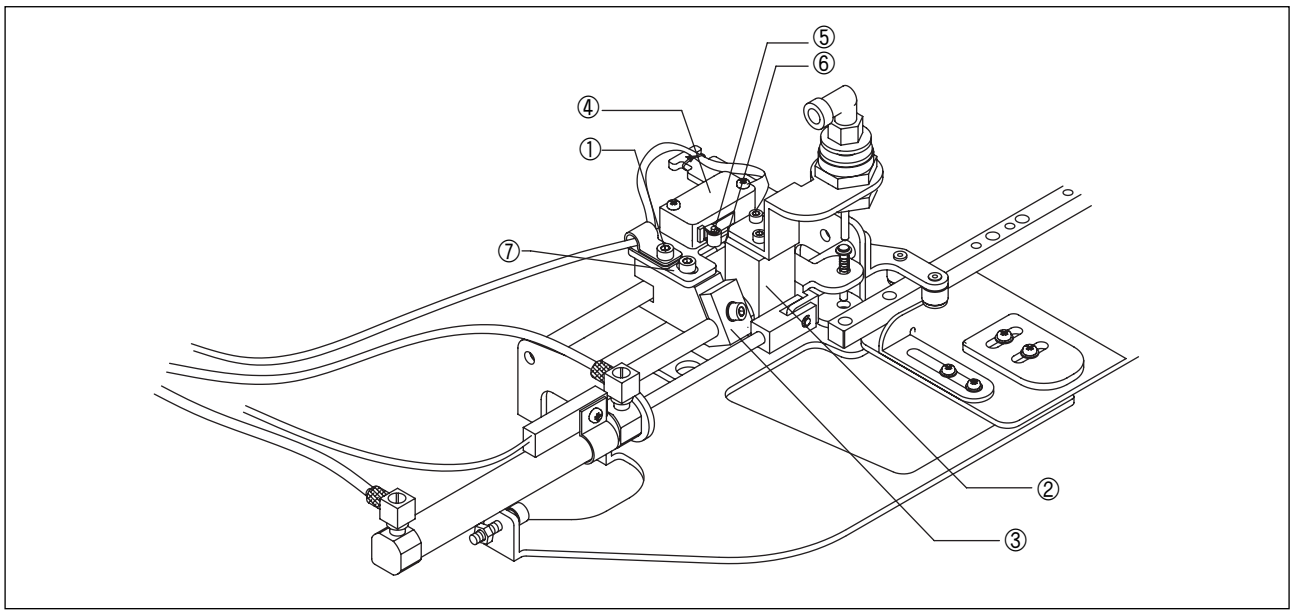
When the transfer movement block touches the stopper block, the limit switch(left) shall be activated.

A. Loosen the bolt①.

B. Make the transfer movement block② touch the stopper block③.

C. Adjust the position of the setting plate of the limit switch⑤, in order to enable the part A of the transfer movement block ② to press the roller of the limit switch(left)④.

D. Tighten the bolt①.



[Fig. 15]

8) Adjust limit switch (right)

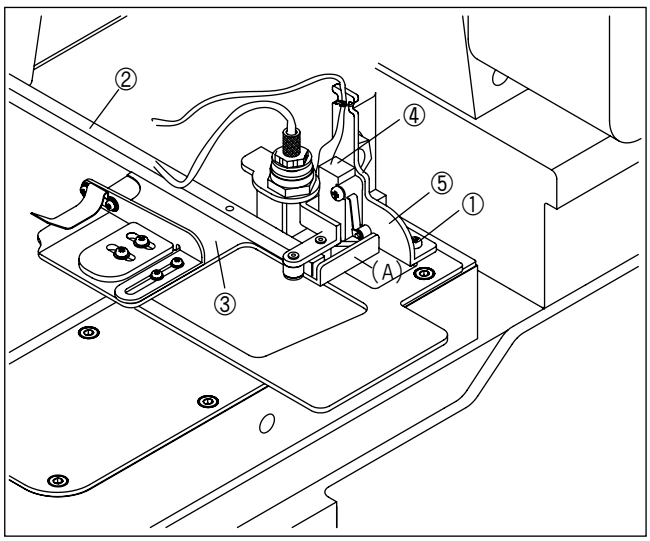
When the transfer movement block touches the stopper block, the limit switch (left) shall be activated.

A. Loosen the bolt①.

B. Move the cloth transfer bar② to the setting position in the left.

C. Adjust the position of the cloth transfer guide (right)⑤ in order to enable the part (A) of the cloth transfer plate (right)③ could press the roller of the limit switch (right)④.

D. Tighten the bolt①.



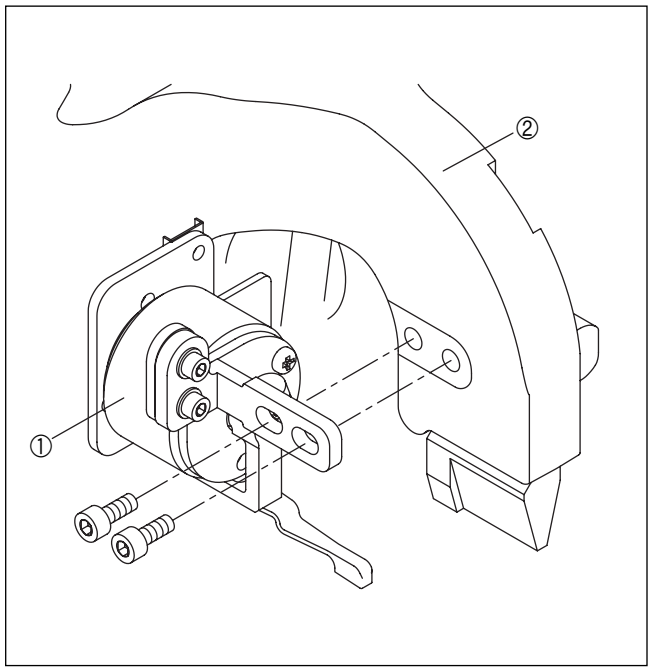
[Fig. 16]

2

Special Lapel Cutter

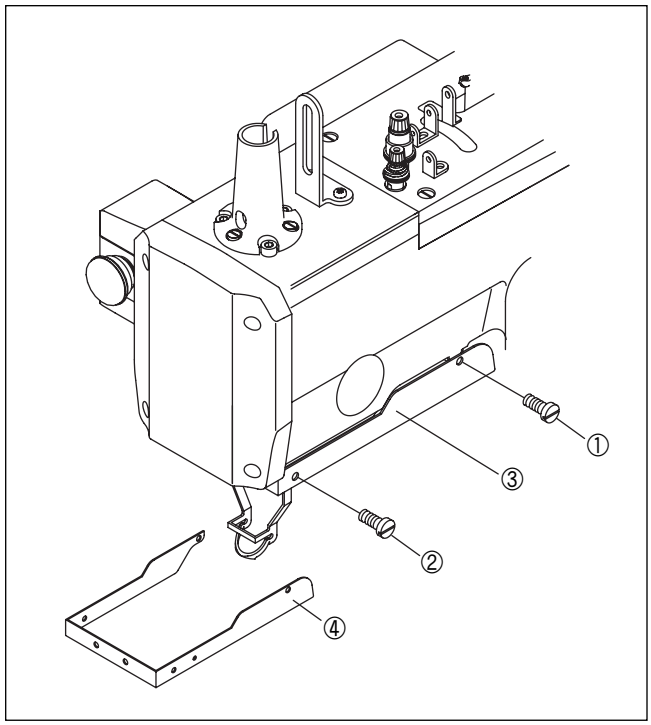
1) Install special lapel cutter

A. Attach the special lapel cutting device① to the cutter lever②.



[Fig. 17]

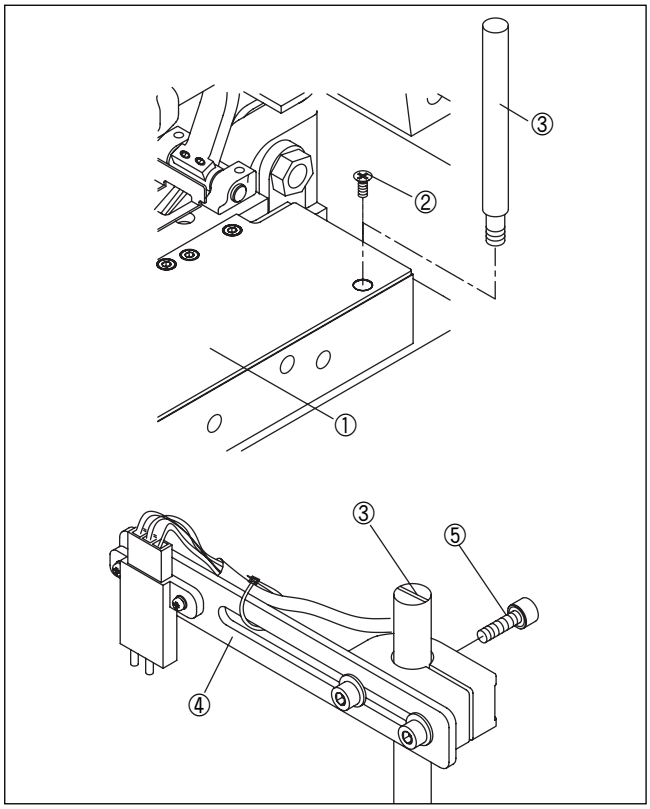
B. Loosen the screws①,② and remove the timing pulley cover of the needle bar③. Replace it with the (B)-type timing pulley cover of the needle④.



[Fig. 18]

C. Remove the fastening screw② of the transfer base cover (right)① and assemble the sensor setting axis③ at the same place.

D. Insert the sensor setting plate④ into the sensor setting axis③ and then tighten the screw⑤.

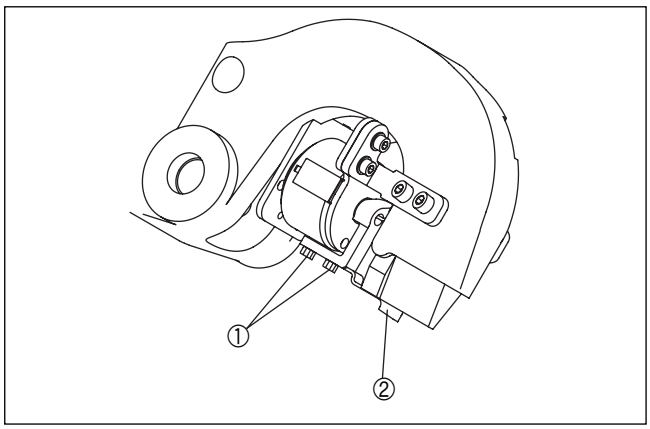


[Fig. 19]

E. Remove hammer plate

If the sewing machine is attached with the special lapel cutter, but is not going to be used, the hammer plate shall be removed.

Loosen the bolt① and remove the hammer plate②.



[Fig. 20]

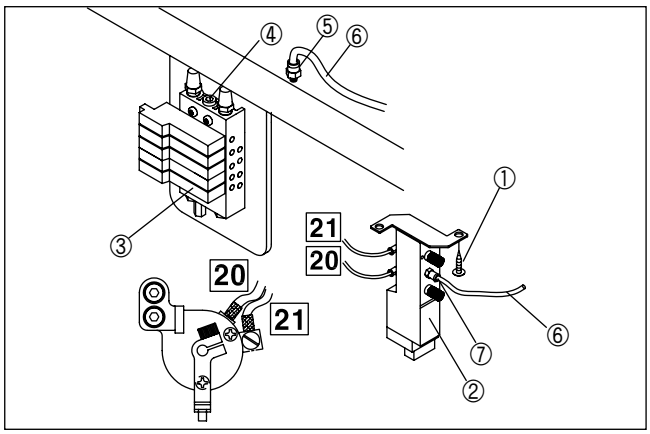
2) Install solenoid valve

A. Install the solenoid valve② on the lower part of the table by using screw nails①.

B. Remove the plug④ of the main solenoid valve③ and attach the nipple⑤.

C. Connect nipple ⑤ and nipple⑦ using air hose⑥ (ϕ 4).

D. Connect air hoses 20, 21 to the machine as in the figure.



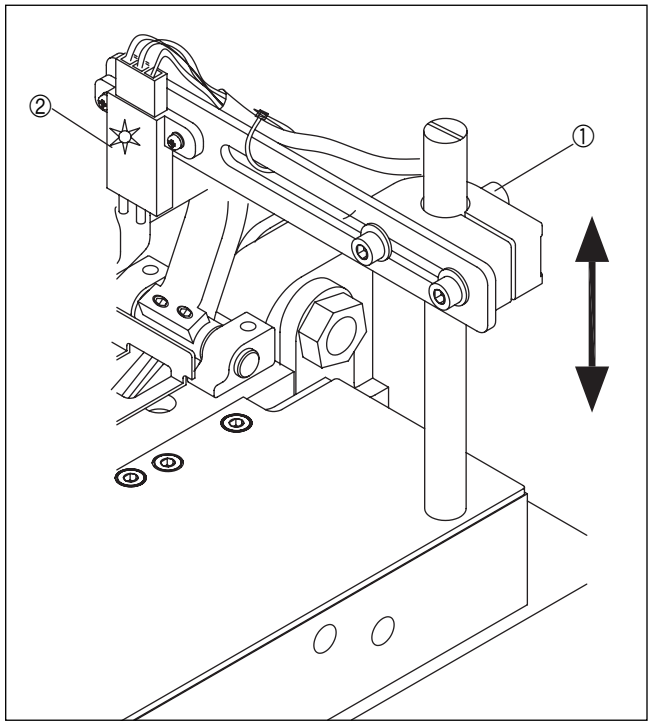
[Fig. 21]

3) Adjust the position of button hole sensor

A. Adjust height

Loosen the screw① and adjust the height of the button hole sensor②.

Configure the LED of the button hole sensor in the way that if the sewing material is located under the button hole sensor, the LED of the sensor is turned off. In the same way, if there is no sewing material under the button hole sensor, the LED would be turned on.

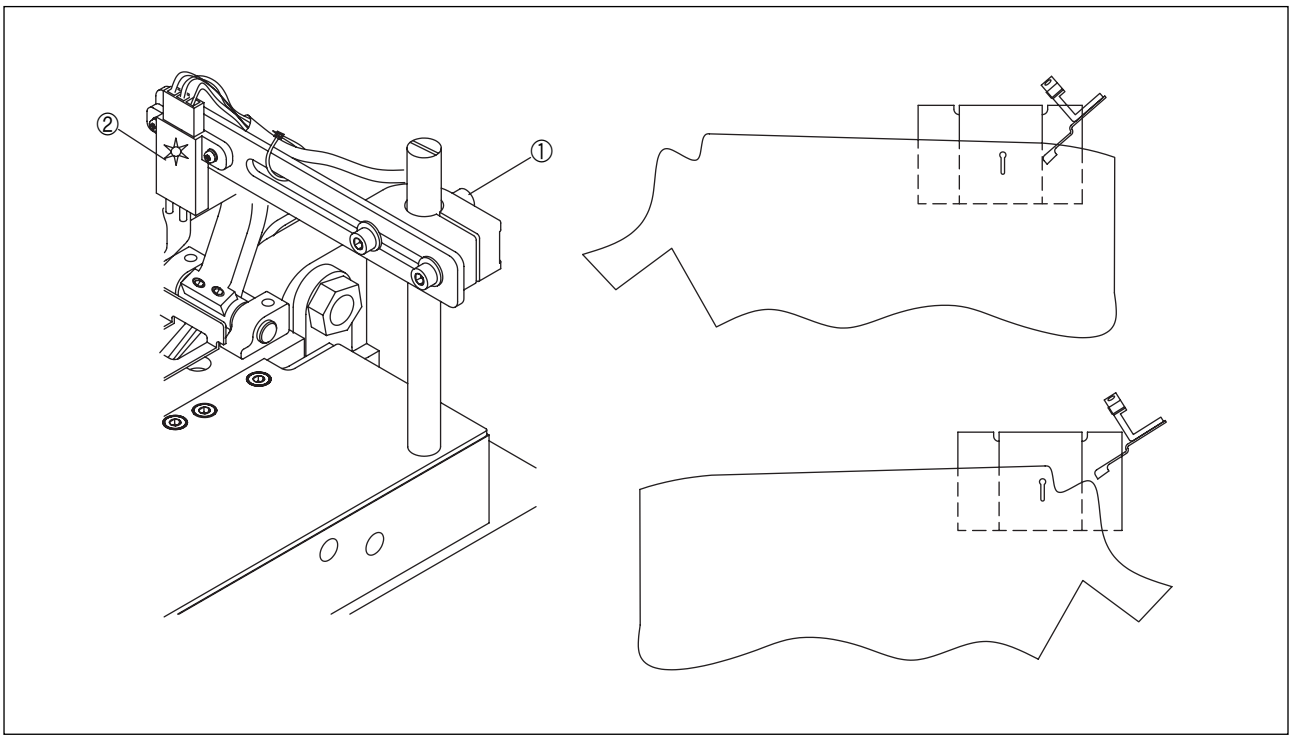


[Fig. 22]

B. Adjust position

Loosen the screw① and adjust the position of the button hole sensor②.

Configure the sensor in the way that in case of sewing eyelet button holes, the sewing cloth will be located below the button hole sensor, and in case of sewing straight line button holes, the sewing cloth shall not be located below the sensor.

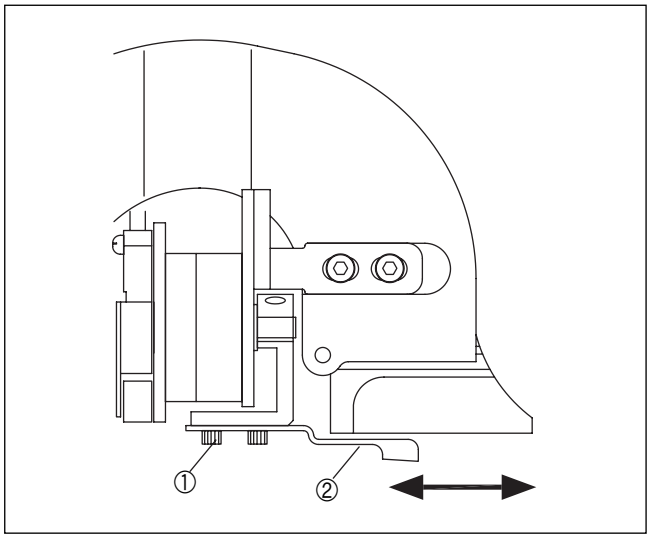


[Fig. 23]

4) Adjust the position of hammer plate

A. Back/forth movement

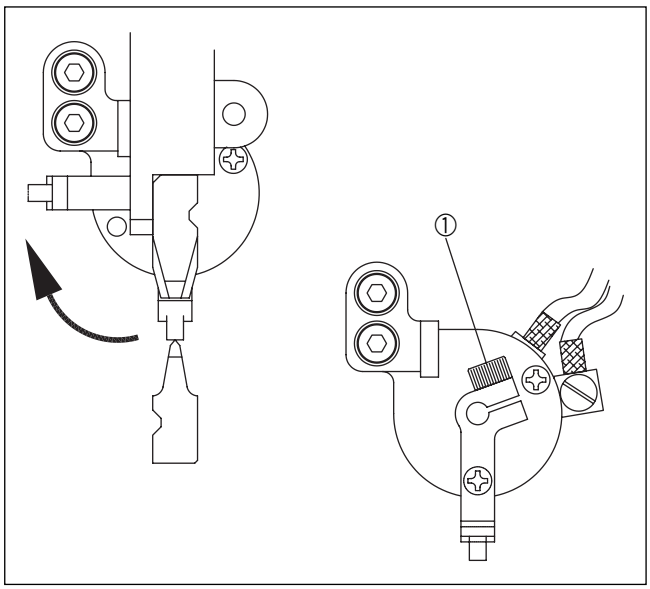
Loosen the bolt① and adjust the position of the hammer plate② by moving it back and forth.



[Fig. 24]

B. Spinning movement

Loosen the bolt① and adjust the position of the hammer plate to put it at the center of the cutter.



[Fig. 25]

3

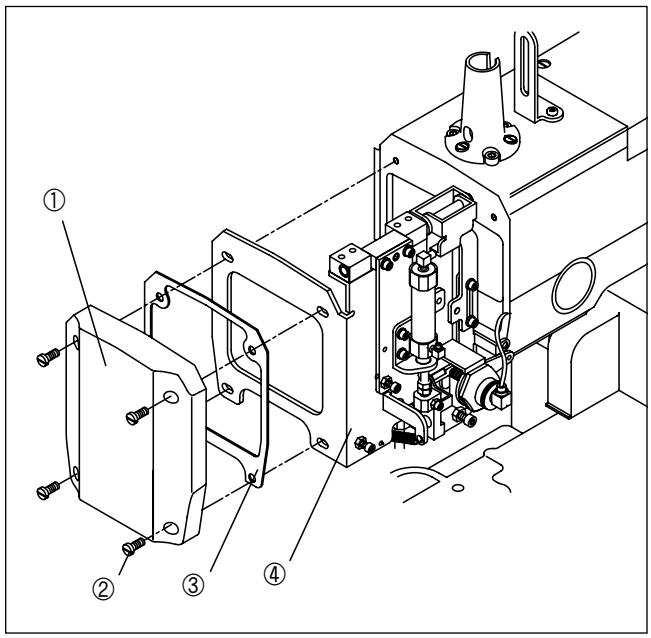
Upper Thread Holder

1) Install upper thread holder

A. Install the upper thread holding device

ⓐ Remove the finger guard and the timing belt cover of the needle bar

ⓑ Install the face plate and the face plate gasket③ by using the face plate screws② after remove the face plate①.



[Fig. 26]

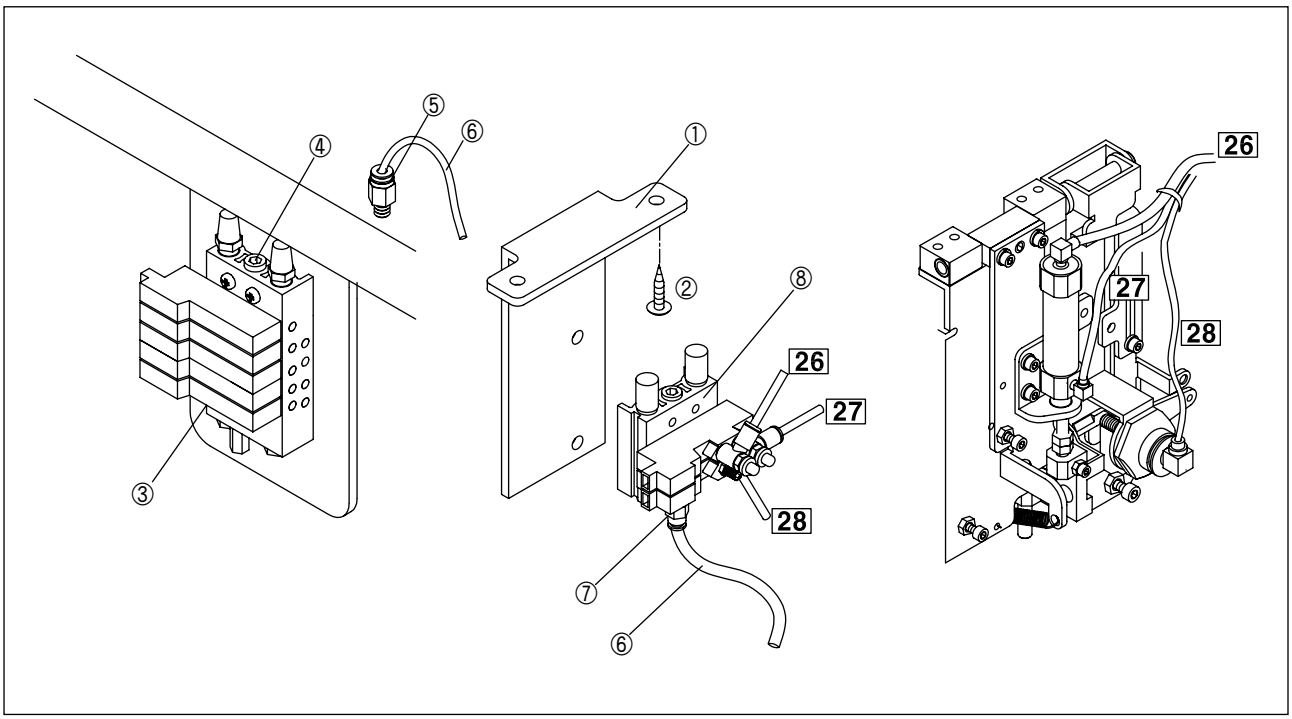
B. Connecting air hoses

ⓐ Attach the manifold bracket(D)① to the back of the table using the screw②.

ⓑ Remove the plug④ of the main solenoid valve③ and install the joint⑤.

ⓒ Link the joint⑤ and the nipple⑦ using the air hose⑥(ϕ 6).

ⓓ Insert the air hoses 26, 27, 28 of the upper thread holder to the related places of the solenoid valve⑧ respectively.



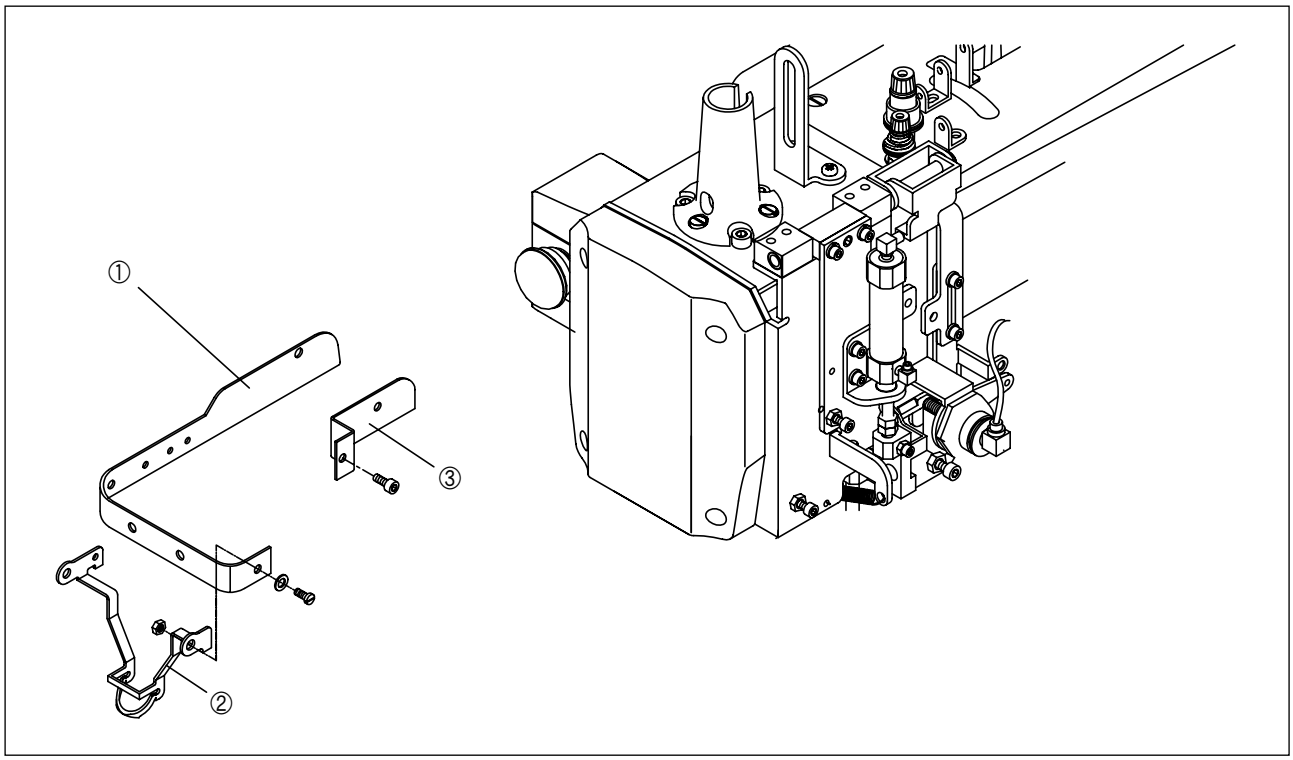
[Fig. 27]

C. Install the timing belt cover(C)

ⓐ Install the finger guard② on the timing belt cover(C)①.

ⓑ Install the timing belt cover(C)①.

ⓒ Install the timing belt cover(D)③.

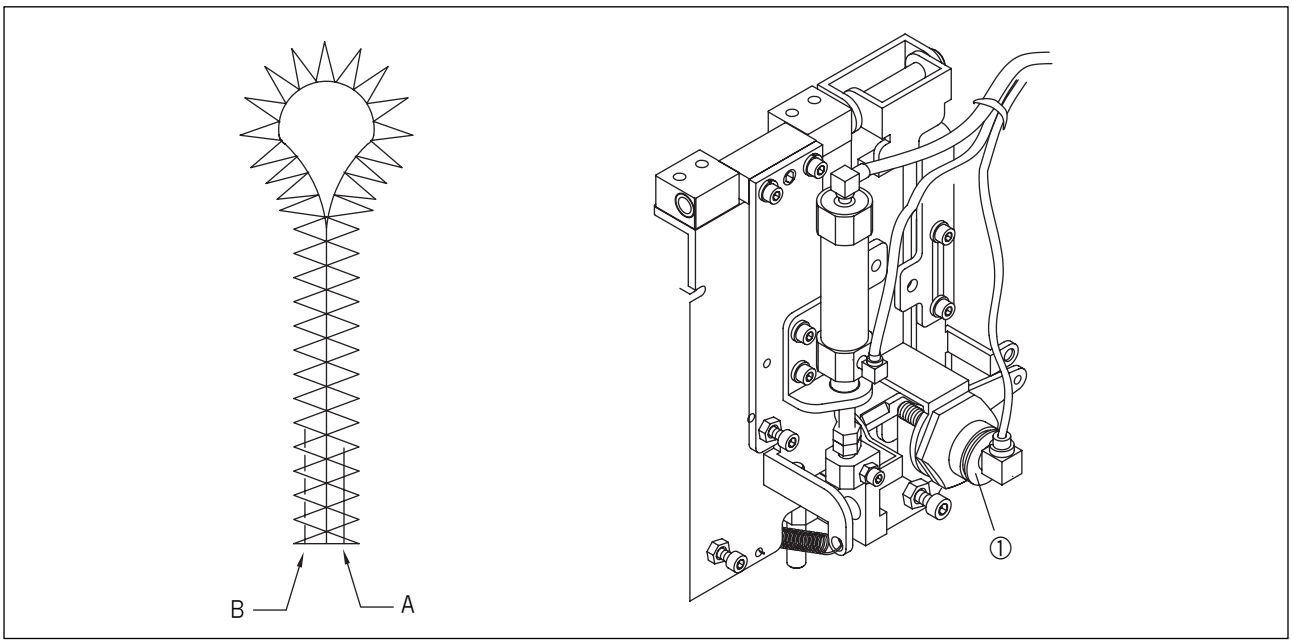


[Fig. 28]

2) Adjust Upper Thread Holder

A. Adjust the position of the side of the upper thread holder

Generally, the baselines of the sewing starting point A and the sewing ending point B are different when sewing eyelet button holes. Therefore the thread holder setting cylinder① alters the baseline of the upper thread holder.



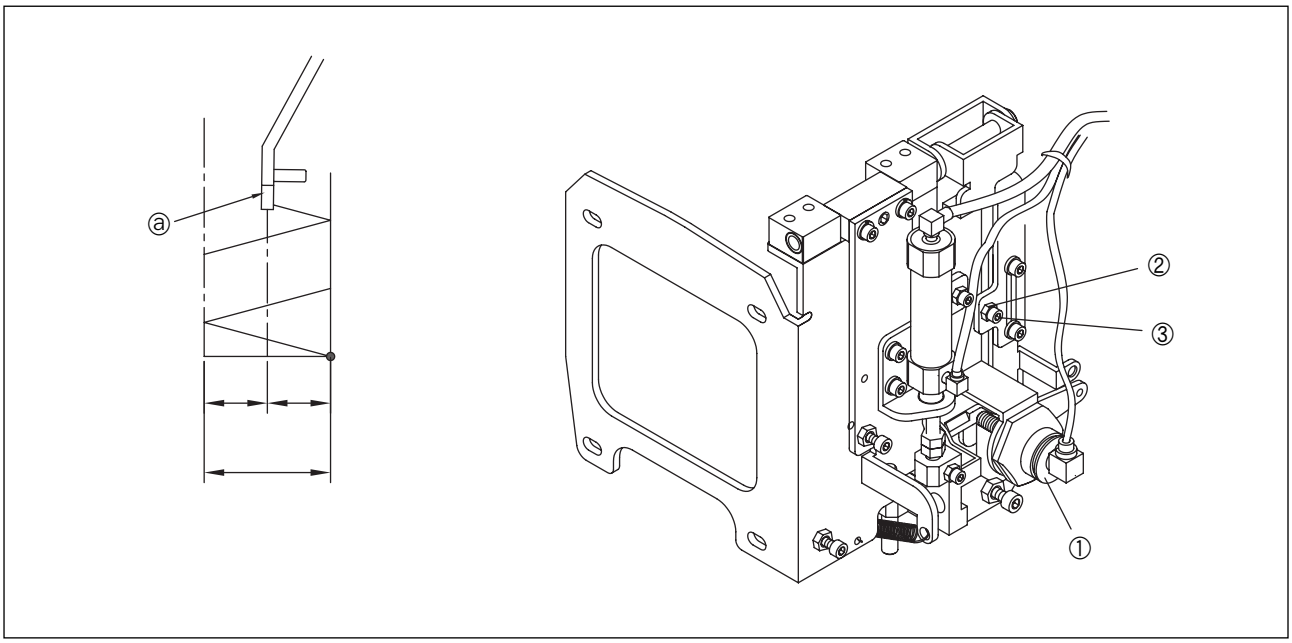
[Fig. 29]

B. Adjust the position of the sewing starting baseline

ⓐ Manually move the X-Y feed base to the sewing starting point.

ⓑ Confirm that the thread holder setting cylinder① is on.

ⓒ Use the adjusting screw② and nut③ to make the center of zigzag switch length in line with the center of the thread holder front endⓐ.

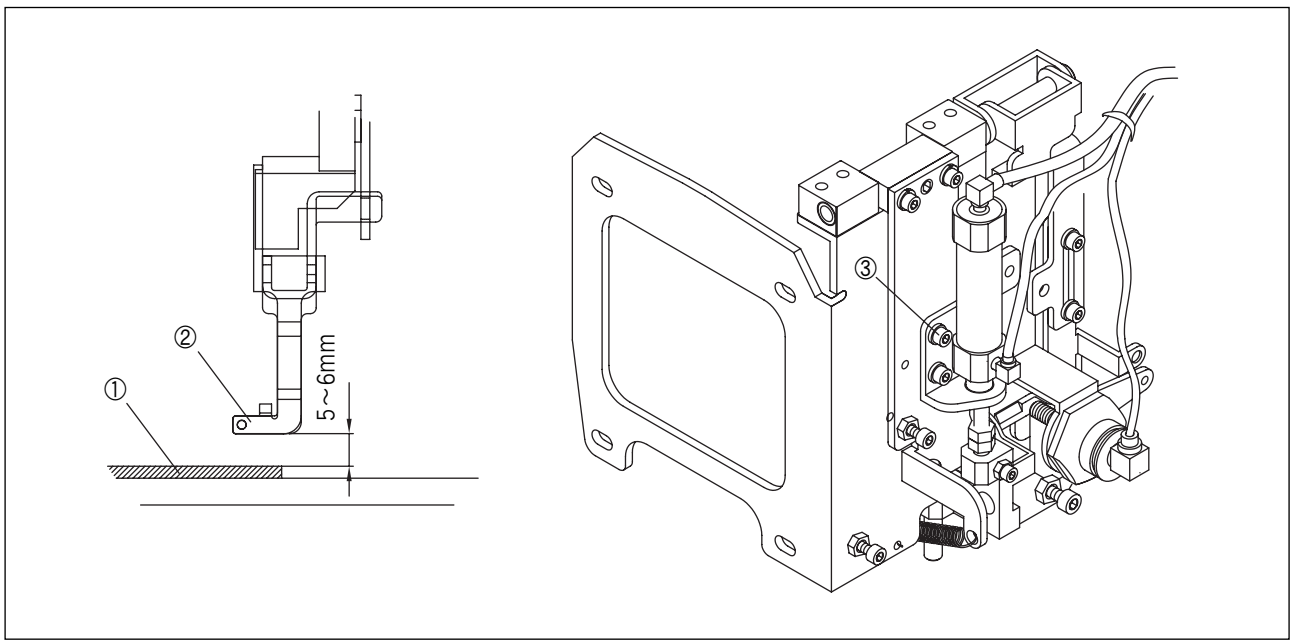


[Fig. 30]

C. Adjust the vertical position of the thread holder

ⓐ Manually move the X-Y feed base to the sewing starting point.

ⓑ If the thread holder is located below the sewing starting baseline, adjust the distance between the upper side of the needle plate① and the lower side of the thread holder② at 5~6mm by releasing the screw③.



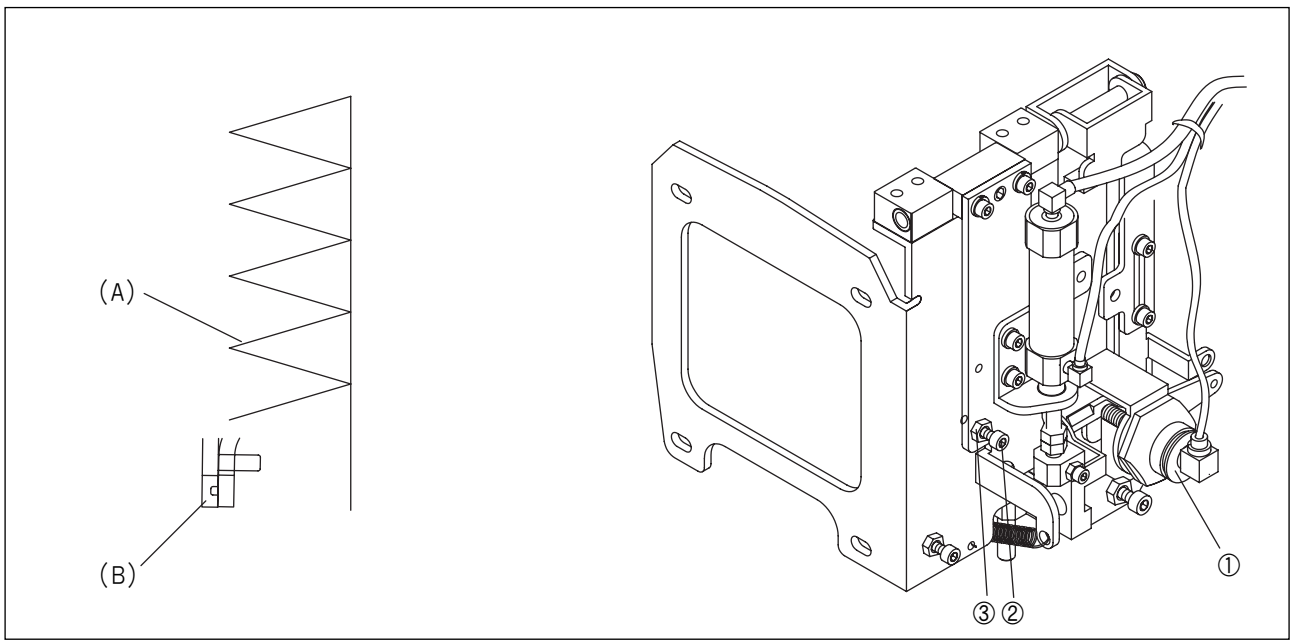
[Fig. 31]

D. Adjust the position of the sewing ending baseline

ⓐ Manually operate the sewing machine to the point where the upper thread holder starts running.

ⓑ Confirm that the thread holder setting cylinder①.

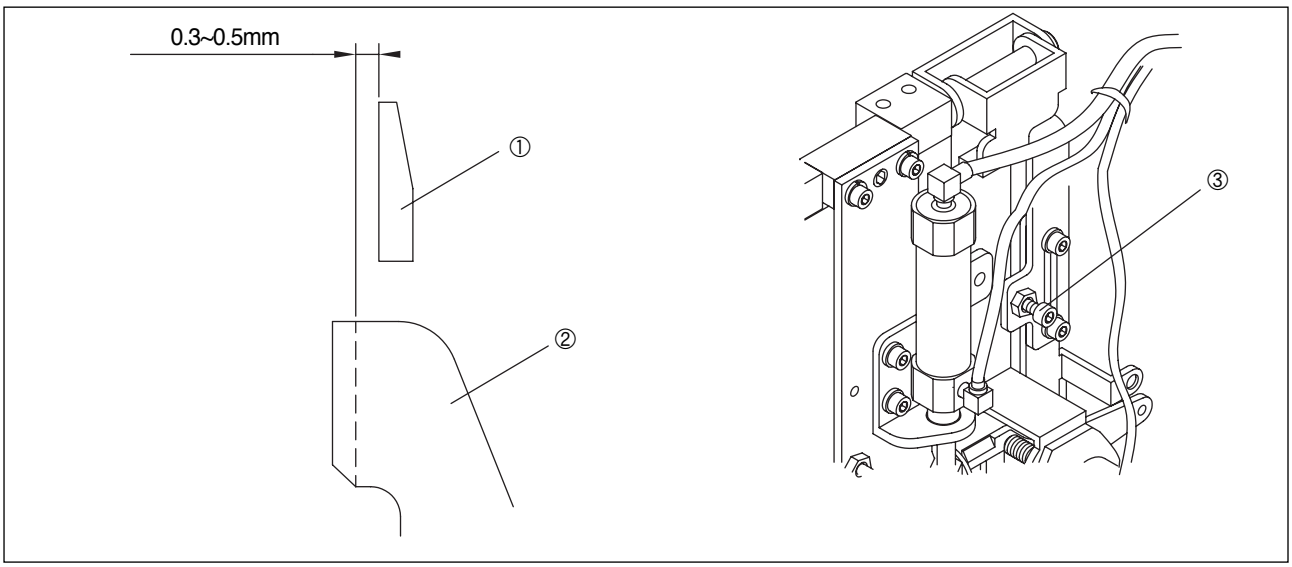
ⓒ Adjust the adjusting screw② and nut③ to put the left (A) side of the zigzag stitch length in line with the inside (B) of the thread holder front end.



[Fig. 32]

E. Adjust the passing position of the cam lever for the upper thread holder

When the thread holder lever② passes toward the cam lever for the upper thread holder① from the sewing starting point (when the baseline position change cylinder is on), adjust the distance between the two at 0.3~0.5mm by turning the fastening screw③.



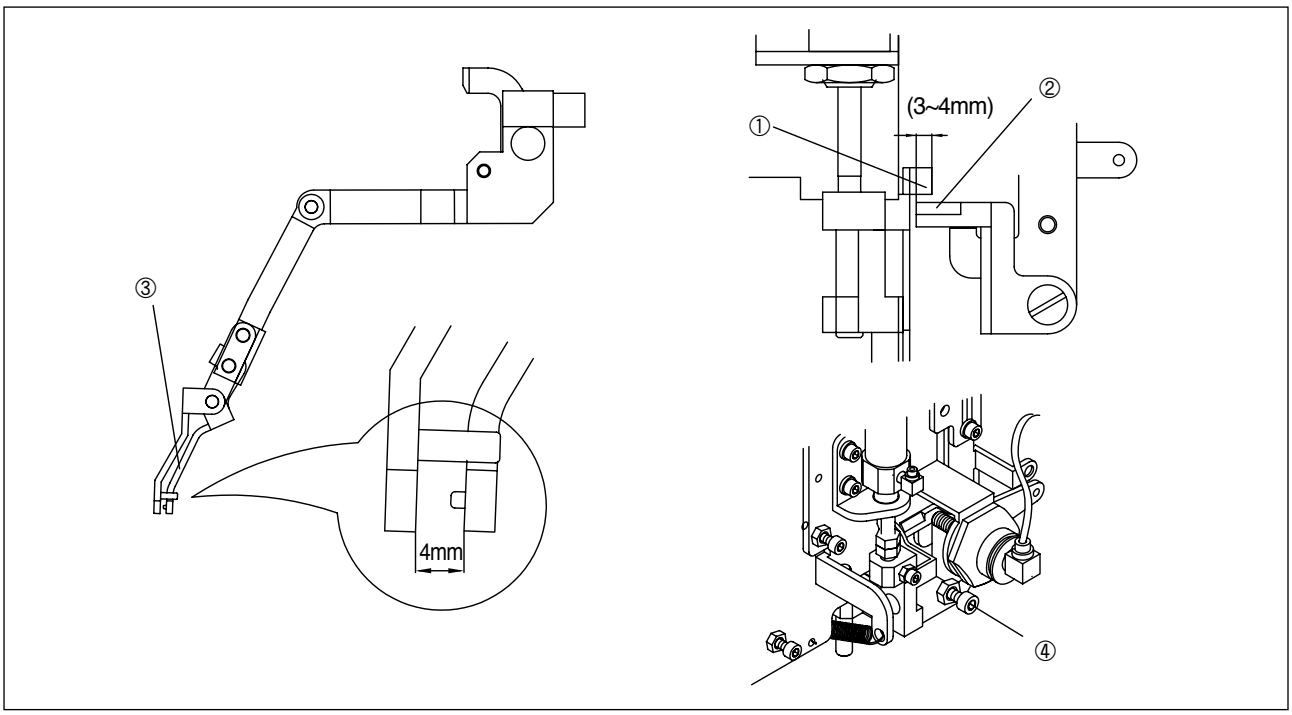
[Fig. 33]

F. Adjust the opening of the thread holder

ⓐ Let the air out.

ⓑ When the thread holder③ comes down until the thread holder lever① touches the cam plate② of the cam lever for the upper thread holder, the back end of the thread holder③ will be open. Then make the thread holder lever① overlap with the cam plate② of the cam lever for the upper thread holder by 3~4mm.

ⓒ Adjust the opening to some 4mm by turning the screw④.

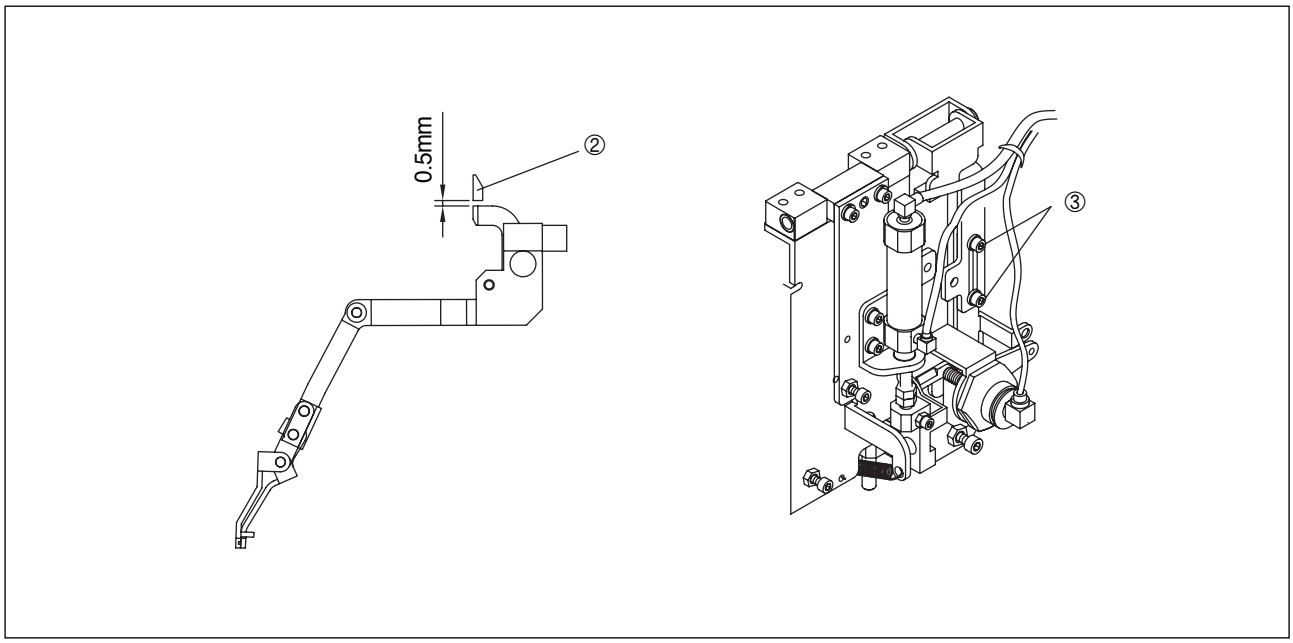


[Fig. 34]

G. Adjust the height of the cam lever for the upper thread holder

ⓐ Let the air out.

ⓑ Set the distance between the lower part① of the cam lever for the upper thread holder guide and the upper part② of the thread holder lever at 0.5mm by loosening the adjusting screw③.



[Fig. 35]

4

Foot Switch

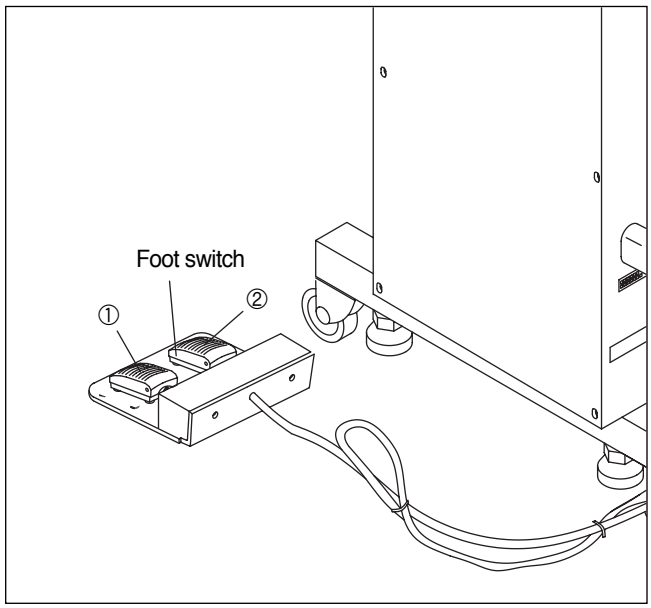
1) Install and operate foot switch

A. Disassemble the hand switch attached to the bed and remove the connector from the control box.

B. Link the foot switch connector to the control box

C. Step on the foot switch①, the clamp comes down to fix the sewing materials.

D. When the sewing material is completely fixed, sewing can begin by stepping on the foot switch②.



[Fig. 36]